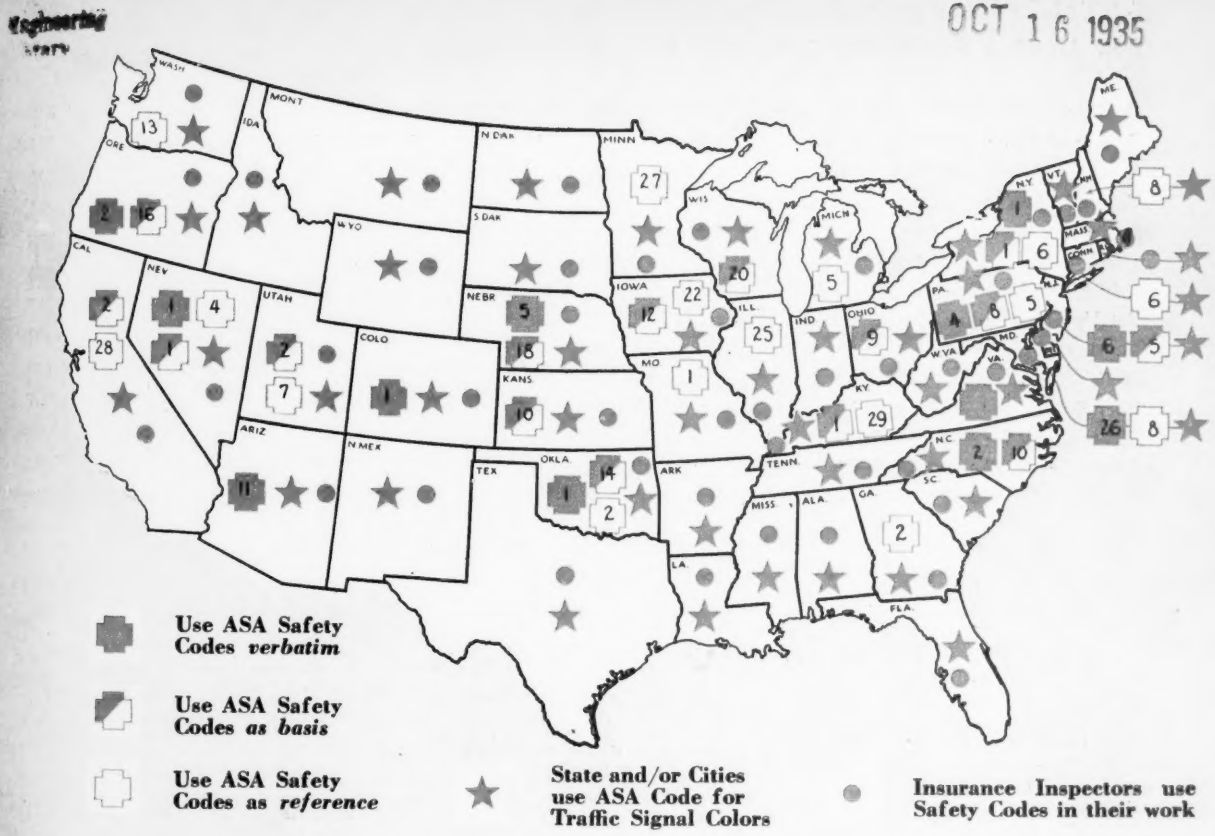
Industrial
Standardization
and Commercial Standards Monthly



(Note: Numbers shown on symbols indicate number of ASA Safety Codes used in the respective states.)

American Standard Safety Codes Are Now Widely Used by States

See Page 266 for Nation-wide Analysis

This Issue:

Front Cover: W. J. Johanson, ASA Staff.

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1935 Revision of National Electrical Code Is Approved

by

A. R. Small

President, Underwriters' Laboratories; Chairman, Sectional Committee on The National Electrical Code[1]

Requirements for light, heat, and power installations in respect to fire hazards is voted an American Standard.

New edition is 18th of work begun nearly 40 years ago by Fire Protection Association.

THE new, 1935, edition of the National Electrical Code, has been approved as an American Standard and is listed as ASA Project C1. The assigned scope is:

"Requirements for the installation of electric wiring and equipment for light, heat, and power, as they affect the fire hazard, and for signaling systems, so far as they may involve such hazard. The Code also includes equipments affecting the life hazard in numerous applications and uses."

This edition is the eighteenth in a whole series begun in 1897, and is the sixth edition as to which American Standards Association has found a satisfactory consensus.

The National Electrical Code is regularly published by the National Board of Fire Underwriters as one of its contributions to safeguarding life and property. The sponsor for the Code is the National Fire Protection Association, the Electrical Committee of which is organized to function under the rules of ASA for sectional committee procedure.

Upwards of 150,000 copies of each biennial edition of the Code are distributed to state, municipal and insurance electrical inspection organizations, to electrical contractors, wholesalers, manufacturers, and to individual wiremen and others concerned.

Code Is Widely Recognized

The requirements of the National Electrical Code as an Approved American Standards have formal acceptance and recognition in many jurisdictions. An outstanding new instance of this is found in a law adopted in the State of Oregon in 1935 specifying its statewide use as minimum requirements to be enforced by the Department of Labor. Washington, D. C., and Portland, Oregon, are instances of a city's electrical wiring ordinance being very nearly a verbatim copy of the current edition of the Code.

While the 1935 edition includes many changes from the text of that for 1933, it is reasonably accurate to say that there are none of major importance. It is natural that this should be so since the Code in its successive editions merely reflects new developments in the electrical industry that are significant from the point of view of regulation in safeguarding life and property.

Nevertheless, to determine upon these changes the sectional electrical committee assembled last March for a meeting which continued through nine morning, afternoon, and evening sittings. There was a generous attendance of members and alternates throughout the period. These individuals represent 18 branches of industry and government.

That a consensus was arrived at is witnessed by the outcome of the letter-ballot required by ASA procedure. Out of 44 voting members, 42 voted affirmatively, one member was recorded as not voting, another member voted affirmatively but was recorded as dissenting on a single new item.

This is neither the time nor the place for a dis-

[1]Electrical Committee, National Fire Protection Association.

"Bible" of Electrical Industry, Inspectors

The National Electrical Code has been cited often as "the bible of the industry."

Its phenomenal sales and distribution —reaching nearly 150,000 biennially— make it a "best seller" in the field of standardization.

Manufacturers and wholesalers of electrical equipment, electrical contractors and wiremen as well as state, municipal and insurance inspectors are among those who rely upon its contents in their work.

cussion of the so-called "bare neutral" controversy which has appeared at times to disrupt the generally harmonious and co-operative program of the Electrical Committee. Nevertheless, it should be said that in several previous editions complete omission of insulation from a grounded service conductor has been permitted under certain limitations.

Proposals to extend this use of non-insulated grounded conductors to circuits within premises were thoroughly debated this year. The outcome was consent by the entire attendance at the final sitting to a provision in Section 513, paragraphs *a* and *b*, permitting the use of an approved cable assembly for wiring a special circuit supplying a range only; the cable to have the grounded conductor insulated only by the insulation and fibrous coverings of the ungrounded conductors plus the flame and moisture-proofed fibrous coverings of the cable assembly.

Since the difference of potential between a grounded circuit conductor and any grounded piping or structural metal of a building will be in the order of five volts or less and since the dielectric strength of such a non-metallic outer covering of the cable assembly will exceed this low value of potential difference most, if not all, technical bases for opposing Code recognition of this restricted form of "bare-neutral" wiring are removed.

The Electrical Committee unanimously approved a report of a special committee proposing exhaustive study of the editorial form and arrangement of the National Electrical Code. In view of this it may transpire that the forthcoming 1935 edition is the last one to employ the form first appearing in the edition for 1923.

NRA Consumer Groups Merged; W. H. Hamilton Is Director

The Consumers' Division of the NRA has started an attack on consumer problems under authority of an order by the President, for the purpose of maintaining and bettering the American standard of living.

Walton H. Hamilton, chairman of the NRA Advisory Council and adviser to the President on consumers' problems, is in charge of the agency, which represents a consolidation of the activities of the Consumers' Advisory Board of the NRA, the Consumers' Division of the National Emergency Council, and the Cabinet Committee on Price Policy.

Mr. Hamilton announced that the new consolidated unit was now at work seeking "ways and means for the consuming public to get more for its money."

Objectives Set Forth

Its activities and objectives include the following:

1. Inquiries by economists into prices and price-determining structures of specific industries to develop means of eliminating those "trouble spots" in production-distribution systems which keep products out of the consumers' reach.
2. Education of the public to recognize and encourage wider use of quality standards and grade labeling.
3. Studies of the consumers' cooperative movement both here and abroad with a view to making information on organization and administrative methods available to American groups interested in cooperative purchasing.
4. Further organization of consumers' county councils on a nation-wide basis to gather data and distribute educational information on problems.
5. The recognition of the interests of the consumer in all matters dealing with production, price and trade practices.
6. Review of current legislation and public policy from the consumers' viewpoint.

Bureau of Standards Urges Use Of 10-Lb Steel Tape Tension

The National Bureau of Standards, in its *Technical News Bulletin*, September, urges that all users of steel tapes use the Bureau's standard tension of 10 lb for tapes between 25 to 100 ft in length when the tapes are used supported on a horizontal flat surface. The standard temperature adopted by the Bureau is 68 F.

Certain work done by the C.W.A. State surveys was done with 11 lb tension. The difference between the 10 lb tension and the 11 lb as specified by the Federal agency in charge is about 0.001 ft, the Bureau points out.

The 10 lb tension at 68 F for steel tapes represented general practice of the Bureau for some years before the official adoption of the standard in 1922.

New Standard Acid Container Urged by Chemical Industry

A standard type of glass container for the transportation of mineral acids and corrosive liquids will be used by the chemical industry for future purchases, if the recommendations of the Manufacturing Chemists' Association are followed by the industry.

As the result of work started by the Carboy Committee of the Association in 1931, and following extensive tests and research by the Committee as to the best features of the three existing types of containers, and the comparative advantages of a 12-gallon or 13-gallon container, the Committee recommended the adoption of a new-design 13-gallon container.

This recommendation received final approval by the Executive Committee of the Manufacturing Chemists' Association in December, 1934, and the Association urged the chemical industry to adopt the "M.C.A. Standard Carboy" as new purchases are made.

The glass carboy is the oldest container used for the transportation of mineral acids and certain corrosive liquids. Its extensive use is attributed to its cheapness, resistance to corrosion, and ease of handling. At first a variety of carboys made from different moulds were used in the chemical industry. Finally, however, the number was reduced to three.

How Standard Was Developed

The investigation which resulted in the adoption of the new "M.C.A. Standard Carboy" was divided into five parts:

Part I.—A critical study of the three existing types of carboys with the objective of determining the best features and the weak points in the design of each of these bottles. All tests were made with naked, unpacked bottles.

Part 2.—The design of a model carboy and the preparation of moulds embodying the good features of the existing types and a correction of their weaknesses.

Part 3—The manufacture of new 12 gallon and 13 gallon carboys according to the design set forth under Part 2 and the formulation of a program of tests.

Part 4—Comparative tests of the 12 and the 13 gallon new-design carboys with each other and with the three existing types, these tests being made with naked, unpacked bottles. The second part of this study included comparative tests of the two new and the three existing types of carboys packed in each of the selected types of packing units.

Part 5—The recommendation by the Carboy Committee that the new 13-gallon carboy be adopted for use by the chemical industry and known as the "M.C.A. Standard Carboy" received final approval by the Executive Committee of the Manufacturing Chemists' Association.

The Manufacturing Chemists' Association outlines the advantages of the new standard carboy as follows:

Longer Life.—The availability of a new carboy of superior quality and greater durability as compared with any carboys heretofore in use, thus not only increasing the life of the container but in addition reducing the container cost for products shipped therein and the amount of breakage and hazard.

Economy of Production.—The adoption of a standard carboy will result in the elimination of waste in production of three different and distinct types of design. The amount of culls resulting from the new standard carboy will be minimized due to the new design being better adapted to the exacting requirements of the carboy manufacturer. Greater skill is acquired by the operators in the manufacture of a single type. The elimination of the narrow mouth—1½ in. x 1¾ in.—carboy will reduce waste in manufacture and also reduce the time from the blowing of the carboy to the introduction into the annealing oven or lehr.

Interchangeability.—A standard carboy in the chemical industry will make all carboys interchangeable. It will eliminate the accumulation of "stranger" carboys of different sizes at the chemical plants and the trouble and difficulty of returning these to the original owner for credit.

Ease of Handling.—A standard carboy also has advantages for both rail and truck transportation not possessed by the three present types which vary substantially in dimensions. It is confidently believed that breakage losses will decrease and consequently damage and breakage claims against the carriers will likewise decline which may result in better and more favorable rating in the freight tariff.

One of the requirements of the standard specifications for the M.C.A. Standard Carboy is that each bottle conforming to the standard shall have embossed on the bottom of the bottle the mark "M.C.A. Std."

The standard specifications for the M.C.A. Standard Carboy can be obtained from the Manufacturing Chemists' Association, 608 Woodward Building, Washington, D. C.

British Auto Industry's Standards Work Gaining

British automobile manufacturers are showing an increased interest in co-operative research, the fourth annual report of the Research and Standardization Committee of the Institution of Automobile Engineers shows.

A new and larger laboratory is contemplated.

Membership of the committee has increased from 144 to 163 members during the past year, *Engineer*, London, reports.

States Curb Loss of Life by Using American Standard Safety Codes

ASA Approved Codes Widely Used by Regulatory Bodies to Reduce Accident Toll in Factories

248 State and Federal Officials Are Working With Representatives of Manufacturers, Engineering Societies, and Other Experts in Writing and Revising 34 ASA Industrial Safety Codes

AMERICAN Standard Safety Codes are becoming the bulwark of safety regulations throughout the country, with three-fourths of the states having industrial safety codes or regulations using some of the 34 American Standards Association approved codes either in whole or in part.

Thirty-four states of the union have industrial safety regulations, and of these 27 have adopted some of the 34 American Standard industrial safety codes "as is," or "as a basis" for their own rules. Eleven of these 27 states have adopted American Standard Codes without change, and fifteen states are using these ASA approved codes as a basis for their regulations. Eight of these 27 states have both used American Standard codes "as is" and have used others in developing their codes on other subjects. Seventeen states reported that they are using American Standard codes "as a reference."

Questionnaires sent to the 48 states to determine the extent of use of American Standard Safety Codes showed that recent industrial activity in the southern states has increased the interest of state officials in factory safety requirements.

The questionnaires disclosed[1]:

34 states have industrial safety codes.
25 of these states use American Standard codes in whole or in part.
9 states have safety regulations, but not on subjects covered by the list of 34 industrial safety codes listed in the questionnaire.
12 states have no safety laws, but several of these "advise" manufacturers on safety requirements.
2 states did not reply.

Interest in industrial safety ranges from "very slight" in non-industrial states, to "keen" in those states where mechanized manufacturing has cost huge tolls of life, limb, and expense through neglect and carelessness. Many of the states have well organized and thorough-going inspection departments. Other states offer advice to manufacturers and other employers, but have no legislation to enforce industrial safety codes generally.

Authorities in the field of accident prevention agree that writing a safety code is only the first step toward saving life, limb, and property. A code, to be worth the paper it is printed on, must be used as a medium for educating workers to be careful. Safety devices, such as guards for gears, punch presses, abrasive wheels, and other equipment, show the employee that management is interested in his safety. The worker must learn that these devices alone will not prevent injury.

State and Federal Experts Help

In developing and revising American Standard industrial safety codes, 137 state regulatory officials and 111 representatives of Federal departments and bureaus serve on the 34 ASA committees. Ten state officials and 11 Federal safety experts are members of the ASA Safety Code Correlating Committee, which supervises the broad safety code program of the Association.

This close cooperation on this work by state and government officials is one of the reasons why American Standard codes have been used so widely as a basis for state regulations. These

[1]Because of the time and expense involved, no attempt has been made to compare the technical provisions of the state codes not based on national standards with the American Standard codes on like subjects. Such an analysis would show additional facts as to the degree of uniformity that exists.

Serving Industry's Best Interests

INDUSTRY, both in regard to its manufacturing and merchandising problems, has a huge stake in *uniform* industrial safety codes, which are being developed under the auspices of the American Standards Association with the cooperation of state, federal and municipal regulatory officials, insurance safety inspectors and safety experts of industrial corporations.

Good business demands competent standards for workers in factories and mills. These standards should transcend state boundaries, as American Standard Codes do.

Uniform safety requirements in all states end confusion in the design of products. In every respect American Standard Codes serve industry's best interests.—*Howard Coonley, President, The Walworth Company.*

fetCodes

codes, written by these public officials, manufacturers, and users of machinery, represent the soundest possible requirements on subjects covered.

Several state officials pointed out that their codes did not cover subjects of the group of American Standard codes, but said that they would use the ASA approved recommendations for such projects should the need arise. Many industrial commissioners explained that their codes antedated the American Standard documents, but these would be used by them for making revisions of their existing regulations.

Although not included in the questionnaire, the American Standard Code for Colors for Traffic Signals, one of the first public safety codes approved by the ASA, is one of the most far-reaching regulations in the United States. The administration of this code is also a municipal function, in addition to being under the jurisdiction of state authorities.

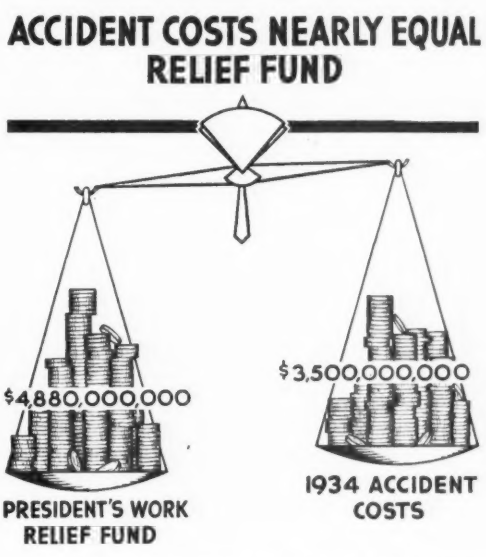
Other states have safety codes on subjects other than those covered by the thirty-nine American Standard codes. The Boiler Code of the American Society of Mechanical Engineers, for example, is used in 21 states and 19 cities.

ASA Codes Are Legal Requirements

Maryland leads in the use of American Standard industrial safety codes. All American Standard Codes are the legal minimum requirements in the state of Maryland. The twenty-six state industrial regulations covered by the American Standard codes have been adopted without change. The state has other codes not among the ASA group, however.

Several states which have no formal safety regulations reported that ASA codes are used by their inspectors who base their recommendations to manufacturing plants on these codes.

The Safety Code for the Use, Care, and Protection of Abrasive Wheels leads the list of the thirty-four ASA approved industrial safety codes in use in the United States. Fifteen states have adopted the American Standard Abrasive Wheel



Courtesy, National Safety Council

State Officials Say:

". . . We are striving to adopt American Standard Safety Codes wherever possible, and many of our State Codes have items in them that, in effect, are the same as those in your national codes. . . ." *C. H. Fry, California Industrial Accident Commission.*

"We will take from your codes the essential features, as far as Illinois is concerned, in revising our industrial safety regulations." *M. J. Smuczynski, Chief, Division of Factory Inspection, Illinois Department of Labor.*

"This department does not adopt safety codes, but it does use many American Standard Safety Codes as a guide in fixing the standards of inspection. We feel that they have been of great assistance to us. . . ." *Ora Williams, Secretary, Iowa Women's Compensation Service.*

"American Standard Safety Codes are recommended for use in Kentucky in bulletins issued by this department," *P. W. Pennington, Chief, Department of Labor of Kentucky,* writes. The state has laws covering blower and exhaust systems and some phases of industrial sanitation, and recommendations covering ventilation and fire hazards.

". . . New Jersey's state committee on safety codes, recently appointed, will give very serious consideration to American Standard Safety Codes that may be applicable to our state. . . . " *New Jersey Department of Labor.*

"We are following the American Standard Safety Codes almost entirely." *W. A. Pat Murphy, Commissioner of Labor, Oklahoma.*

"Our Safety Code Commission has tentatively agreed to recommend the adoption of American Standard Safety Codes *in toto* in so far as they do not conflict with State Statutes." *W. H. Nickels, Jr., Safety Commissioner of Virginia.*

". . . Our General Standards are patterned very closely after the American Standard Safety Codes. . . ." *Jay Olinger, Supervisor of Safety and Industrial Relations, State of Washington.*

code "as is" or have used it in writing their own regulations. Five other states have written their codes independently, but three of these states will use the ASA approved code in revising their regulations on this subject, it was reported.

Eleven commonwealths are using the National Electrical Code as a part of their state regulations. However, several thousand municipalities and other jurisdictions are using this code in their building regulations in every part of the country. Its revision, announced in this issue of INDUSTRIAL STANDARDIZATION, will probably have a distribution of more than 150,000, making it the most widely used of any American Standards Association approved code.

American Standards Are Guide

Many states with a well developed industrial safety program use American Standard Codes as a guide in their enforcement work, where they have no state regulation covering the subjects contained in the ASA group.

Superintendent C. H. Fry of the California Industrial Accident Commission, in commenting upon the questionnaire, wrote:

". . . it is impossible to properly represent our situation by merely checking the questionnaire. We are striving to adopt the American Standard codes wherever possible, and many of our safety orders have items in them that are in effect the same as those in the national codes."

Illinois has established the policy of using American Standard codes for the revision of all its safety regulations. It has used provisions of twenty-five of the American Standard codes in its industrial safety regulations.

The State Bureau of Labor of Iowa uses American Standard safety codes "as a guide in fixing standards of inspection in establishments visited by representatives of this department. We feel that they have been of great assistance to us," J. D. Seaman, Deputy Labor Commissioner, wrote. In the twelve subjects covered by both the Iowa regulations and the ASA approved codes, the department has based its regulations upon the American Standard codes, the questionnaire showed.

New Jersey Names Committee

New Jersey recently appointed a committee to develop a more comprehensive safety code program for that state. "We will give serious consideration to such American Standard safety codes as will be applicable to industries of New Jersey," the Industrial Commission wrote.

New York has many safety codes for industrial workers, but many of these are not on the subjects covered by the codes approved by the American

Standards Association. Seven of New York's safety regulations for workers are based upon the same principles and have similar requirements in many respects to the American Standard codes, one is used *verbatim* and one is used "as a basis."

Oklahoma's Commissioner of Labor, W. A. Pat Murphy, wrote, "We are following the American Standard Safety codes almost entirely," and to date sixteen of the state's industrial safety requirements are based upon American Standard codes. One, he reported, has been adopted *verbatim.*

Thirteen of Pennsylvania's industrial safety regulations are based upon American Standard codes and four have been adopted from the ASA approved safety codes in their entirety. These four are:

Abrasive Wheels
National Electrical Code
Protection of Heads and Eyes
Power Presses

As more and more industries are establishing manufacturing plants in the southern states, the need for sound and workable industrial safety codes is being felt.

W. H. Nickels, Jr., of the Industrial Commission of Virginia, reports that the Commission has agreed to recommend to the next session of the Virginia General Assembly "the adoption of American Standard safety codes *in toto,* insofar as they do not conflict with existing state statutes."

Acceptance of ASA Codes

"This means," Mr. Nickels explained, "the acceptance of ASA codes as the basis for the operation of all industries in Virginia as a means of accomplishing the objects of a safety program. Also, it serves as the basis of settling any dispute or controversy on the part of State departments as to what is or is not a standard requirement."

In the State of Washington, writes Supervisor Jay Olinger of the Department of Safety and Industrial Relations, the "general safety standards are patterned very closely after the American Standard Codes." Special safety orders of that state, however, cover many subjects not dealt with in the thirty-five ASA industrial safety projects.

The ASA safety codes for Elevators, Dumb Waiters and Escalators; Laundry Machines and Operation; Lighting of Factories, etc.; and Safety Code for Woodworking Plants are being used in 10 states.

Maryland, Nebraska, Oklahoma, and Wisconsin are using all four, and Iowa, Kansas, North Carolina, Ohio, Oregon, and Pennsylvania are using three of these, together with other ASA codes.

Beside the ten states using the ASA Elevator Code, seven states have codes of their own. Six

How States Use ASA Safety Codes

Wide use of American Standard industrial safety codes is shown in this table. (The ASA has approved 34 industrial safety codes to date.)

Column 1 shows the states which use American Standard Codes "as is" in their state regulations;

Column 2 shows the states which use American Standard Codes "as the basis" for their own legislation, and

Column 3 shows states which use American Standard Codes in revising their regulations, and in making recommendations to establishments upon which their representatives call.

Column 4 shows total of ASA codes used by states.

How American Standard Industrial Safety Codes Are Used

State	*Used Without Change*	*Used "as Basis"*	*Used as Reference*	*Total Codes Used*
Arizona	11	—	—	11
California	—	2	28	30
Colorado	1	—	—	1
Connecticut	—	—	6	6
Georgia	—	—	2	2
Illinois	—	—	25	25
Iowa	—	12	22	34
Kansas	—	10	—	10
Kentucky	—	1	29	30
Maryland	26	—	8	34
Michigan	—	—	5	5
Minnesota	—	—	27	27
Missouri	—	—	1	1
Nebraska	5	18	—	23
Nevada	1	1	4	6
New Hampshire	—	—	8	8
New Jersey	6	5	—	11
New York	1	1	6	8
North Carolina	2	10	—	12
Ohio	—	9	—	9
Oklahoma	1	14	2	17
Oregon	2	16	—	18
Pennsylvania	4	8	5	17
Utah	—	2	7	9
Virginia	(Commission recommended adoption of all ASA Codes)			
Washington	—	—	13	13
Wisconsin	—	20	—	20

The following states did not report having regulations on any of the subjects covered by the 34 American Standard industrial safety codes:

Alabama, Arkansas, Delaware, Florida, Idaho, Indiana, Louisiana, Maine, Massachusetts, Mississippi, Montana, North Dakota, Rhode Island, South Carolina, South Dakota, Texas, Vermont, West Virginia, and Wyoming.

Replies were not received from New Mexico and Tennessee.

Courtesy, National Safety Council

states have developed their own codes for laundry machinery, and lighting of factories, etc., and three states have independent codes for protection of employees in wood-working plants.

The American Standard Ladder Code, Safety Code for Foot and Power Presses, and Code for Railings and Toe Boards are being used in nine states. Six states have independent ladder codes, two have their own codes on power presses, and five have safety codes for railings and toe boards.

Eight states use the ASA Safety Code for Power Transmissions.

The American Standard Safety Code for Floor and Wall Openings; Foundry Safety Code; and the Code for the Protection of Heads and Eyes have been adopted in seven states.

Six ASA codes are a part of the regulations of five states. These are the Building Exit Code; Code for Safety in Construction; Forging and Hot Metal Stamping; Safety Code for Logging and Saw Mills; Safety Code for Paper and Pulp Mills; and the Window Cleaning Safety Code.

The Electrical Safety Code, the Code for Mechanical Refrigeration, and the Textile Safety Code have been adopted in whole or in part by four states, and three states have used Fire Tests for Building Materials, Code for Prevention of Dust Explosions, and the Safety Code for Rubber Mills and Calendars.

The code for Identification of Gas Mask Containers has been adopted by two states, as has been the Gas Safety Code, and the Safety Code for Ladders and Stairs in Mines. One state each has adopted a single American Standard safety code.

All but three of the thirty-five safety codes have been written into the law of one or more states, the survey shows. These are in the coal-mining safety field, where an aggressive safety prevention program has been developed by the Bureau of Mines, Department of the Interior.

States, Cities and U. S. Experts Aid Code Work

The degree of cooperation between state and municipal regulatory officials, government experts and industry is shown by the number of public authority representations on the Safety Code Correlating Committee and industrial safety code committees under the procedure of the American Standards Association.

The activity of state, municipal and federal safety officials is a primary reason why so many states and cities use American Standard codes in enforcing safety programs throughout the country.

A recent analysis of representations on ASA safety committees follows:

	ASA Safety Code Correlating Committee	*ASA Industrial Safety Code Committees*
Federal Government Experts	11	111
State and City Officials	10	137
Industrial, insurance and independent experts	21	722
Totals	42	970

Codes Used by Insurance Men

Another indication of the effectiveness of the American Standards Association procedure in developing industrial safety codes is shown by the general use of these codes by insurance inspection engineers in every state in the Union. Even in Ohio, where the state has a virtual monopoly on industrial casualty insurance through the Workmen's Compensation Fund, insurance company inspectors turn to the American Standard Codes to make suggestions to their insured in respect to safe construction and other phases of safety.

Federal Housing Administration Names Members on ASA Council

Miles L. Colean, Technical Director, Federal Housing Adminstration, and Albert C. Shire will represent the FHA on the Standards Council of the American Standards Association. The Federal Housing Administration recently became a Member-Body of the ASA, in order to cooperate more closely with the national standardization work.

Underwear Institute Issues New Standard Size Booklet

The Underwear Institute has recently published its new booklet "Standard Sizes for Knit Underwear". This booklet represents the culmination of seventeen months of work by the Institute's Stadardization Committee and Research Associate in cooperation with the National Bureau of Standards.

Standards contained in the first edition of the booklet have been revised and numerous measurements for garments, for which there were formerly no standards, have been included in the new edition. The booklet contains 72 standards for knitted garments and measurements for 9 woven underwear garments, standard box sizes, washing instructions, symbols for model designations, and cone colors for single cotton yarn.

Accepted by Manufacturers

"Standard Sizes for Knit Underwear" has been widely accepted by manufacturers throughout the United States. Numerous requests for this booklet received from Canada and England are gratifying evidence to the Institute of the interest in underwear standardization.

The procedure followed in developing Standard Sizes and Measurements for the new items is, first, to ascertain the present practice of the industry by means of questionnaires sent out to all knit underwear manufacturers. When the number of replies indicate that the data received are representative of the entire industry, the measurements are averaged.

Using these averages as a basis, proposed standard measurements are prepared at the Bureau of Standards by the Research Associate and are then presented to the Standardization Committee of the Institute for consideration. Garments of key sizes are sometimes made according to the proposed measurements and modeled as a check. Allowance is made for shrinkage in the selection of the proposed measurements.

The proposed standards, as revised or changed by the Standardization Committee in the light of its practical manufacturing experience, are then submitted to the whole industry for a vote by mail. If approved by an overwhelming majority of the industry, the proposed measurements become accepted Standards of the Industry.

The first edition of the Standards was given approval by the industry as Commercial Standard CS 33-32 under the procedure of the National Bureau of Standards. The Underwear Institute has announced its intention to submit the new Standards and changes to the Bureau for approval of producers, distributors, and consumers, as a part of this Commercial Standard.

"Standard Sizes for Knit Underwear", can be borrowed from the American Standards Association Library, or can be bought from the Underwear Institute, 2 Park Avenue, $2.00 a copy.

All Accidental Deaths, by States 1931 to 1934

State	Provisional State Reports			U. S. Census Bureau Reports		
	1933	1934	Death Rate 1934*	1931	1932	1933
Total U.S.**	**91,087**	**101,000**	**79.9**	**97,415**	**89,167**	**91,087**
Ala.	1,540	1,652	61.0	1,653	1,808	1,597
Ariz.	469	491	107.4	481	428	457
Ark.	1,002	1,065	56.8	1,184	1,028	1,070
Calif.	5,153	5,566	90.4	5,502	5,175	5,224
Colo.	886	899	85.1	943	951	930
Conn.	1,162	1,321	79.8	1,172	1,099	1,124
Del.	194	227	93.8	200	206	217
D. C.	430	521	104.8	471	447	438
Fla.	1,396	1,613	102.4	1,429	1,313	1,378
Ga.	1,996	2,134	73.3	1,999	1,925	1,996
Idaho	354	405	90.4	381	317	374
Ill.	5,735	6,923	87.9	6,464	5,421	5,616
Ind.	2,713	3,104	93.9	2,961	2,542	2,867
Iowa	1,546	1,997	80.4	2,062	1,741	1,775
Kans.	1,541	1,755	92.1	1,442	1,427	1,543
Ky.	1,643	1,842	69.3	1,894	1,954	1,971
La.	1,415	1,486	68.6	1,459	1,378	1,443
Maine		No Report		676	576	672
Md.	1,366	1,424	85.2	1,375	1,326	1,304
Mass.	2,798	3,145	72.5	2,818	2,738	2,759
Mich.	3,304	3,774	74.1	3,732	3,271	3,378
Minn.	1,913	2,000	76.9	2,105	1,829	1,925
Miss.	1,144	1,177	57.2	1,264	1,159	1,223
Mo.		No Report		2,911	2,700	2,581
Mont.	495	557	103.6	510	442	508
Neb.	895	1,067	76.5	980	909	915
Nev.	136	167	177.0	181	166	151
N. H.		No Report		373	318	386
N. J.	2,912	3,102	73.3	3,251	2,912	2,979
N. Mex.	311	383	87.6	340	330	310
N. Y.	8,973	9,380	71.8	9,660	9,111	8,973
N. Car.	1,685	1,962	59.4	1,994	1,759	2,007
N. Dak.	362	367	53.3	392	277	385
Ohio	5,827	6,706	98.1	5,972	5,545	5,754
Okla.	1,123	1,313	53.1	1,358	1,410	1,451
Ore.	743	861	87.0	855	810	786
Penn.	7,342	7,631	77.7	7,945	7,003	7,144
R. I.	392	380	53.9	399	374	377
So. Car.	973	1,350	77.1	1,168	1,013	1,077
So. Dak.	421	443	62.8	437	377	424
Tenn.	1,828	2,029	75.8	1,799	1,680	1,809
Texas	3,469	4,013	66.1	***	***	4,038
Utah	313	413	79.4	432	394	370
Vt.	297	353	97.8	275	273	297
Va.	1,814	1,900	77.7	1,921	1,871	1,865
Wash.	1,392	1,622	100.9	1,396	1,356	1,412
W. Va.	1,476	1,785	99.9	1,749	1,543	1,507
Wis.	2,028	2,225	74.0	2,545	2,043	2,064
Wyo.	238	239	103.0	268	228	236

Source: State Registrars of Vital Statistics, and U. S. Census Bureau.
*Deaths per 100,000 population.
**Totals for years 1931 and 1932 include estimates for states not in the official registration area. The 1934 total is an estimate based on the percentage change shown by the records of State Registrars.
***Not in Death Registration Area.

Best State Records.—Oklahoma, North Dakota, and Rhode Island report 1934 accidental death rates of only 53 per 100,000 population, compared with the national average of 79. If other states had had rates as low as these three the national death toll from accidents would have been only 67,000 instead of 101,000.

Miller, Thompson Elected to Head ASA Building Code Committee

RUDOLPH P. MILLER, the dean of American building code authorities, was elected chairman of the American Standards Association Building Code Correlating Committee when the committee was organized September 17 in Engineers' Building, 29 West 39th Street, New York. George N. Thompson, Chief, Section on Building Codes, National Bureau of Standards, was named vice-chairman.

The organization of this committee gives a much needed impetus to a necessary movement for cleaning up worry of the present confusing conditions in the building code field. Talk of securing more rational and economical standards for building construction has at last crystallized into definite action.

The Correlating Committee will supervise the work of several sectional committees which will be assigned to develop building standards and specifications. These will be made available to municipalities in developing their own building codes, and in this way the collected experience of national organizations can be passed on to the local bodies.

1,600 Building Codes in U. S.

Today there are more than 1,600 building codes in the United States, many of which vary widely as to construction requirements. It is expected that the work of this committee will serve to make building requirements more uniform.

The American Standards Association was asked to undertake work on a national building code by Secretary Roper of the Department of Commerce, when the Department's Building Code Committee was disbanded. The National Bureau of Standards will continue an active interest in the field of building code regulation and will maintain close cooperation with the ASA project.

Mr. Miller, former building code commissioner of Manhattan, New York, was the author of the National Board of Fire Underwriters' Building Code, a code for New York City, Rochester, Niagara Falls, and has been consultant for building codes in other cities. He represents the American Society of Civil Engineers and the American Society for Testing Materials.

The Correlating Committee elected an executive committee, which will develop a plan of procedure to submit to the main committee within 60 days. Members of the executive committee, and the organizations they represent, follow:

J. Andre Fouilhoux, American Institute of Architects;
William P. Capes, American Municipal Association;
W. F. Austin, Associated General Contractors;
Edward W. Roemer, Building Officials' Conference;
W. E. Mallalieu, National Board of Fire Underwriters.
Messrs. Miller and Thompson, *ex officio.*

Architects, builders, and contractors who do a state-wide, regional, or national business find it extremely complicated to change around from one type of code set-up to another. If arrangement alone could be correlated so that particular chapters in any one code were the same as in another, it would save an immense amount of time and would make enforcement of code provisions easier because those responsible for design would know that they had found all the provisions governing their particular project, it has been said.

Commerce Department Pioneered

The Department of Commerce Building Code Committee pioneered in putting requirements on what has since been referred to as a performance basis. As an illustration of this, when setting up requirements for fire resistance of walls it is stated that a fire wall should have an ultimate fire resistance of at least four hours. Before that method of stating requirements was introduced, it was the universal practice to state the materials and thickness required for a fire wall.

Many of the municipal codes and some of the model codes go into rather complete detailed specifications for their requirements dealing with all phases of construction. Obviously, codes written on this basis become obsolete in a short time, unduly delay the acceptance of construction improvements, and hamper architects and engineers in their design. One of the biggest tasks in the building code field today is the extension of this principle of performance requirements to other

features of the code than those treating of fire resistance. The more detailed information to back up these performance requirements can then be given in national standards which need not be printed in the regular code but, under proper legal procedure, may be referred to as *prima facie* evidence of what constitutes good engineering practice.

Suggests Central Organization To Standardize British Welding

A new central organization to take full responsibility for standardization and unification in the welding industry of Great Britain was suggested during a meeting on welding of iron and steel organized by the Iron and Steel Institute in London recently.

The British Standards Institution has done a great deal of work in welding standardization, but because the Institution has no testing facilities the need for some other organization is now felt.

The meeting was in the form of a Symposium, subjects covered including ship welding and classification requirements; inspection and testing; fatigue strength of welds; safety; and technical training of welders.

British Standards on welding which are now in effect include British Standard nomenclature, definitions, and symbols for welding and cutting, British Standard Specifications for testing of weld metal, for welded air receivers, for the metal-arc welding of steel structures, and for electrically-welded chain.

A comprehensive standard on welding was prepared recently after a careful investigation of the whole subject by Lloyd's Register of Shipping, under the title *Tentative Requirements for Fusion-Welded Pressure Vessels Intended for Land Purposes.*

U. S. Machinery Division Head Returns to Private Business

R. E. W. Harrison, Chief, Machinery Division, U. S. Department of Commerce, has resigned to resume consultant practice to the metal-working industries. He will be associated with Eugene C. Clarke, 1818 Packard Building, Philadelphia, and will be technical consultant for client concerns. The scope of his new activity will cover the entire range of management, including design, manufacturing, and merchandising.

Mr. Harrison was appointed Chief of the Machinery Division, Bureau of Foreign and Domestic Commerce in April, 1934.

For several years Mr. Harrison has taken an active part in the work of the American Standards Association, particularly in connection with the projects on Small Tools and Machine Tool Elements, Fits Between Cylindrical Parts, and Classification and Designation of Surface Qualities. Reprints of articles and papers by Mr. Harrison have appeared in previous issues of INDUSTRIAL STANDARDIZATION.

Veteran Building Code Experts on ASA Body

Some of the best known authorities on building codes in the United States are members of the American Standards Association's Building Code Correlating Committee, which is headed by Rudolph P. Miller, chairman, and George N. Thompson, vice-chairman.

The wide representation of the Building Code Correlating Committee is shown by the membership of the following associations, together with their representatives:

American Institute of Architects, *J. Andre Fouilhoux, H. R. Dowswell, (alt.)*
American Municipal Association, *Wm. P. Capes, A. H. Hall, (alt.)*
American Public Health Association, *A. E. Gorman, W. Scott Johnson, (alt.)*
American Society of Civil Engineers, *R. P. Miller, Melvin S. Rich, (alt.)*
American Society for Testing Materials, *R. P. Miller, R. E. Hess, (alt.)*
Associated Factory Mutual Fire Ins. Companies, *F. T. Moses, A. L. Brown, (alt.)*
Associated General Contractors of America, *W. F. Sustin, Daniel T. Webster, (alt.)*
Building Officials' Conference, *Edward W. Roemer, Frank C. Keller, (alt.)*
Federal Housing Administration, *Miles L. Colean, A. C. Shire, (alt.)*
Forest Products Laboratory, *J. A. Newlin, L. J. Markwardt, (alt.)*
International Association of Governmental Labor Officials, *Representative not yet appointed*
National Association of Building Owners & Managers, *Representative not yet appointed*
National Association of Builders' Exchanges, *Emil Diebitsch*
National Association of Real Estate Boards, *H. U. Nelson*
National Board of Fire Underwriters, *W. E. Mallalieu, C. T. Bissell, (alt.)*
National Bureau of Standards, *George Thompson, Vincent B. Phelan, (alt.)*
National Fire Protection Association, *F. H. Wentworth, R. S. Moulton, (alt.)*
National Safety Council, *W. Dean Keefer, (alt.)*
Pacific Coast Building Officials Conference, *David H. Merrill, Walter Putnam, (alt.)*
Procurement Division, Treasury Dept., *C. W. Chamberlain, H. H. Waples, (alt.)*
Public Health Service, Treasury Dept., *R. R. Sayers, Rollo H. Britten, (alt.)*

Widely Used Fire Hose Specifications, Coordinating Standards, Now Revised

A REVISION of the American Tentative Standard Specifications for Cotton Rubber-Lined Fire Hose for Public and Private Fire Department Use, changing the free sulphur content permissible in fire hose from a minimum of 0.5 per cent to a maximum of 1.25 per cent, and advancing the tentative standard to American Standard, has just been approved by the American Standards Association.

Since its original approval in 1929, these specifications have been the basis for the purchase of fire hose by many municipalities and industrial plants. They have been adopted by the Fire Protection Group (the National Fire Protection Association, Associated Factory Mutual Fire Insurance Companies, National Board of Fire Underwriters, and Underwriters' Laboratories), and have been used by insurance interests and Underwriters' Laboratories for rating and inspection purposes.

The standard is under the jurisdiction of a sectional committee, authorized in 1925 under the procedure of the American Standards Association, with the Fire Protection Group and the American Society for Testing Materials as sponsors.

At that time several specifications covering rubber-lined fire hose for public and private fire departments were in existence. These documents had been developed in previous years by Underwriters' Laboratories and the insurance interests, by the A.S.T.M., and by the Federal Specifications Board for use in purchases of fire hose by Federal agencies. These specifications differed in certain particulars, and the project originally before the sectional committee was intended to provide a single specification which would harmonize all the requirements for fire hose.

After considering the problem for more than two years, the sectional committee submitted specifications for fire hose, which were approved as American Tentative Standard in January, 1929. The American Tentative Standard, also a tentative standard of the A.S.T.M., took the place of two A.S.T.M. standards for fire hose, which were subsequently withdrawn.

In 1930, due to changes in manufacturing practice, the Rubber Manufacturers Association proposed that the permissible organic acetone extract be changed from three to four per cent. This

Cities, Government, and Insurance Experts Work With Fire-Hose Makers

Cities, insurance companies, rubber manufacturers, and technical experts are members of the sectional committee, under the procedure of the American Standards Association which has just revised the American Tentative Standard Specifications for Cotton Rubber-Lined Fire Hose for Public and Private Fire Department Use. The organizations which are members of the committee and their representatives are:

Chairman*, P. L. Wormeley, *Federal Specifications Board.

Secretary*, A. F. Matson, *Underwriters' Laboratories.

American Society for Testing Materials, *H. L. Miner; W. L. Sturtevant*

Fire Protection Group

American Marine Standards Committee, *A. R. Small*

Associated Factory Mutual Fire Insurance Companies, *G. W. Angell, C. W. Mowry*

City of New York, Department of Purchase

International City Managers Association, *Wm. A. Holt*

National Fire Protection Association, *Ross A. Davis*

Railway Fire Protection Association, *J. R. Peters*

Rubber Manufacturers Association, *H. M. Frecker, L. J. Howell*

Underwriters' Laboratories, *A. F. Matson, A. H. Nuckolls*

Federal Specifications Board, *P. L. Wormeley*

proposal was accepted by the sectional committee, and the revision was approved as American Tentative Standard in March, 1931.

More recently, the change in the free sulphur content mentioned above was endorsed by the sectional committee and advancement to American Standard was recommended. In its latest action, all members of the sectional committee voted affirmatively on the proposed revision, but Frederick Kenney, who represented the Purchasing Department of the City of New York, voted against advancement of the standard from American Tentative Standard to American Standard. Mr. Kenney's negative ballot was based on his belief that one standard specification for fire hose can not satisfactorily cover the requirements of both private and public fire departments, particularly fire departments of larger cities where the service required from fire hose is especially severe and water pressures are high.

Recently, the American Standards Association was advised by Joseph W. Nicholson, Purchasing Agent for the City of Milwaukee, and Chairman of the Governmental Group of the National Association of Purchasing Agents, that the present specifications are considered inadequate by certain municipalities.

The newly approved standard, American Standard Specifications for Cotton Rubber-Lined Fire Hose for Public and Private Fire Department Use (L3-1935; A.S.T.M. D 296-35) may be purchased from the American Standards Association or from the American Society for Testing Materials, 260 South Broad Street, Philadelphia, at 25 cents a copy. Members of the ASA are entitled to a 20 per cent discount.

Hose Coupling Screw Threads

American Standard Is Available Now

by

H. W. Bearce

Chairman of Sectional Committee on Hose Coupling Screw Threads, and Co-Chief, Division of Weights & Measures, National Bureau of Standards.

THE American Standards Association has approved as an American Standard the report of the Sectional Committee on Hose Coupling Threads for all hose connections having nominal inside diameters of $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, 1, $1\frac{1}{4}$, $1\frac{1}{2}$, and 2 inches (ASA B33.1—1935). This standard, together with the Fire Hose Coupling Thread Standard previously adopted, constitutes a complete hose-coupling thread series from $\frac{1}{2}$ inch to $4\frac{1}{2}$ inches.

While it will not be possible in a brief article to cover in detail the entire history of the project, it will be of interest to mention some of the more important steps that have led to the successful culmination of a standardization program extending over a period of about 20 years.

Prior to 1914 there was a wide variety of hose-coupling threads in use in sizes up to 2 inches. This diversity of practice was shown on a drawing prepared by the Crane Company (A 3183), dated Oct. 25, 1918, and reproduced on page 180 of the Proceedings of the National Fire Protection Association, Vol. 24, 1920. Of the many threads shown to be in use at that time the straight "iron-pipe" thread was indicated as predominating. It was also stated by one of the large manufacturers of hose couplings that this thread had been widely used for that purpose since 1894, or even earlier.

In 1918 the Fire Department Supply and Linen Hose Section of the War Industries Board recommended that for the duration of the war . . . "all hydrants, hose valves, hose couplings, nipples, and nozzles $1\frac{1}{4}$ to 2 inches inclusive be iron-pipe thread for new work" . . .

On March 18, 1920, limiting dimensions for straight iron-pipe thread sizes were designated as

(Publication of this article approved by the Director, National Bureau of Standards, Department of Commerce.)

List Organizations Represented On Fire-Hose Thread Committee

Members of the sectional committee, working under the procedure of the American Standards Association and sponsored by the American Society of Mechanical Engineers, which recommended the new American Standard for hose-coupling threads are:

Chairman*, Henry W. Bearce, *U. S. Department of Commerce, National Bureau of Standards.

Secretary*, Arthur L. Brown, *Associated Factory Mutual Fire Insurance Companies.

American Society of Mechanical Engineers, *Albert F. Breitenstein, Walter E. Dunham*

American Bureau of Shipping, *Jacob Bergvall*

American Marine Standards Committee, *Henry C. E. Meyer*

American Mining Congress, *W. Val DeCamp*

American Society of Sanitary Engineering, *Alfred R. McGonegal*

Associated Factory Mutual Fire Insurance Companies, *Arthur L. Brown, H. B. Stewart (alt.)*

Association of American Railroads—Engineering Division—Construction and Maintenance Section—Water Service, Fire Protection and Sanitation Committee, *Wesley L. Curtiss, J. P. Hanley (alt.)*

Chemical Fire Extinguisher Association, Inc., *A. O. Boniface*

International Association of Fire Chiefs, *Ross B. Davis*

Manufacturers Standardization Society of the Valve and Fittings Industry, *John J. Harman, Frederick C. Ernst (alt.)*

National Automatic Sprinkler Association, *J. Howard Williams*

National Board of Fire Underwriters, *John H. Howland*

National Fire Protection Association, *Arthur M. Houser, R. S. Moulton (alt.)*

Railway Fire Protection Association, *J. R. Peters*

Rubber Manufacturers Association, Inc., *J. W. Fellows*

Society of Naval Architects & Marine Engineers, *H. C. E. Meyer*

Underwriters' Laboratories, *R. W. Hendricks, C. J. Krieger (alt.)*

U. S. Department of Commerce, National Bureau of Standards, *Henry W. Bearce, D. R. Miller (alt.)*

U. S. Department of Commerce-Bureau of Navigation and Steamboat Inspection, *James W. Wilson.*

U. S. Navy Department, Bureau of Construction and Repair, *John Lind (alt.)*

Representing Manufacturers, *J. W. Fellows, W. H. Gourlie, A. E. Hansen, John C. Schellin, W. H. Symonds, A. L. Boerner (alt.)*

National hose-coupling-thread dimensions, and were adopted as such by the National Association of Brass Manufacturers.

From about 1914 to 1920 preliminary work on the standardization of hose-coupling threads was also being done by a committee of the N.F.P.A. The first formal report of this committee was presented to the N.F.P.A. on May 6, 1920. In this report the following sizes and pitches were recommended for hose-coupling threads: $\frac{1}{2}$ in. — $11\frac{1}{2}$; $\frac{3}{4}$ in. — $11\frac{1}{2}$; 1 in. — $11\frac{1}{2}$; $1\frac{1}{4}$ in. — 9; $1\frac{1}{2}$ in. — 9; and 2 in. — 8.

A slightly modified report was adopted by the N.F.P.A. on May 10, 1922. This report, like the earlier one, specified a coarser pitch than the straight iron-pipe thread for the $1\frac{1}{4}$, $1\frac{1}{2}$, and 2 inch sizes.

In the meantime the National Screw Thread Commission had been organized, in September 1918, and as a part of its standardization program had taken up the question of hose-coupling threads. An extensive survey of manufacturers and users of hose threads having indicated a preponderant use of $11\frac{1}{2}$ threads per inch for all sizes up to 2 inches, this thread was adopted and published in the first (1921) report of the Commission. This iron-pipe thread — hose-thread standard was also contained in the 1924 and 1928 reports of the Commission, apparently with the full support and approval of manufacturers and users of hose-coupling threads.

During the period from about 1922 to 1928 the difference of opinion as to the relative advantage of the iron-pipe thread series and the coarser series proposed by the N.F.P.A. committee, for hose-thread service, persisted. On the one hand, the fire protection group supported by the Associated Factory Mutual Fire Insurance Companies, held that the iron-pipe thread was too fine for fire protection purposes; that the thread was too readily damaged by rough usage, and by frequent coupling and uncoupling; that there was danger of crossing the threads in hurried assembly; and that it should be replaced by a coarser thread which in their opinion was better adapted to fire protection purposes.

ASA Solves Controversy

American Standards Association procedure has again solved a controversial problem of long standing between advocates of iron-pipe thread and a coarser pitch thread, for certain sizes of hose couplings.

Makes Best Compromise

The new American Standard for Hose-Coupling Screw Threads represents the best compromise possible at this time between actual common practice and recommended new practice.

On the other hand it was held by the National Screw Thread Commission and by the majority of manufacturers and users of hose-coupling threads that the iron-pipe thread series was in wide use, was reasonably satisfactory, that the danger of crossed threads could be eliminated by specifying a short cylindrical pilot at the end of the nipple, with a 30 deg or 35 deg chamfer at end of both coupling and nipple; that in certain types of service there was no occasion for frequent coupling and uncoupling; and that the iron-pipe thread should be continued in use.

On October 26, 1928, a sectional committee was organized under the procedure of the ASA and this committee has been actively engaged in continuing the work on standardization of hose-coupling threads up to 2 inches nominal inside diameter.

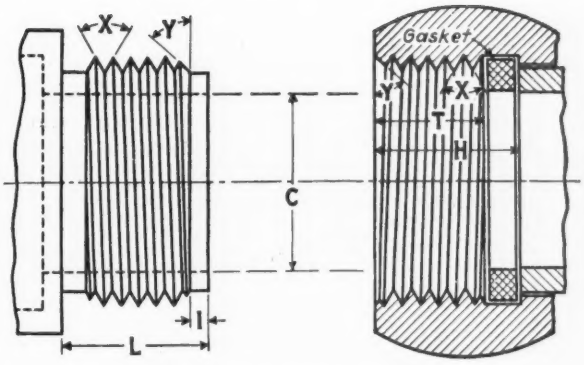
Throughout the life of the sectional committee it has been confronted by the same difficulties that were faced by earlier workers in the field. The outstanding difficulty at all times has been that of deciding whether the iron-pipe thread or a somewhat coarser thread should be specified for the $1\frac{1}{4}$, $1\frac{1}{2}$, and 2-inch sizes.

As in all previous discussions there were those who favored the iron-pipe thread, on the ground of convenience, availability, and preponderance of use; and others who favored the coarser thread on the ground of its greater ruggedness and freedom from damage in service. The committee, thus caught on two horns of a dilemma, was tossed sometimes in one direction and sometimes in the other. There appeared to be no middle ground, no opportunity for a satisfactory compromise.

Does Not Disturb Present Equipment

Inside standpipe service already equipped with iron-pipe-thread hose connections should not be disturbed.

But for new work, the Standard recommends that the 1½ inch—9 threads per inch should be used wherever practicable.



Sketch showing items covered by American Standard in addition to number of threads per inch: angle of thread X (60°); chamfer angle Y (35°); length of nipple (L); depth of coupling (H); thread length for coupling (T); length of pilot (I); inside diameter of nipple (C).

Throughout the period of development of hose-thread standards the possibility of using "adapters" as a means of securing interchangeability between the old standard and the new was often considered. It was pointed out that by the use of adapters threaded to the old standard on one end and to the new standard on the other it would be possible to put the new standard into use without serious expense or inconvenience. Adapters are already in wide use where connection between various standards is necessary.

The report of the sectional committee has been approved and disapproved, revised and re-revised; tables have been arranged and rearranged; explanatory footnotes have been added only to be removed later.

After much discussion and many changes a report was finally submitted to the ASA for approval. As approved by the ASA, the report contains the following sizes and threads per inch for the various services:

Nominal Size	*Service*	*Threads per Inch*
$\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$	Garden and similar hose	$11\frac{1}{2}$
$\frac{3}{4}$, 1	Chemical engine and booster hose	8
$1\frac{1}{2}$	Fire-protection hose	9
$\frac{1}{2}$	Steam, water, air, oil, and all other hose connections*	14
$\frac{3}{4}$		14
1		$11\frac{1}{2}$
$1\frac{1}{4}$		$11\frac{1}{2}$
$1\frac{1}{2}$		$11\frac{1}{2}$
2		$11\frac{1}{2}$

*This group is straight iron pipe thread.

The American Standard, B33.1—1935, in its final form may be regarded as a compromise, and, like all compromises, it is open to a certain amount of objection. It is believed, however, to be the nearest approach to a satisfactory standard that could be agreed upon under existing conditions. It is the hope of the committee that with time and patience the one point of controversy, that is, the number of threads per inch to be used in 1½-inch inside standpipe service, will work itself out to the complete satisfaction of all. In the meantime, it is suggested that inside standpipe service already equipped with iron-pipe-thread hose connections should not be disturbed. For new work the 1½ in. — 9 threads per inch should be used where practicable. While a footnote to that effect would, in my opinion, have helped to clarify the report, the absence of such a footnote should not be regarded as a serious matter.

Dress Fabric Tests Set Up In Recommended Standard

Standard methods of testing woven dress fabrics for breaking strength; color fastness; ability to withstand laundering, dry cleaning and pressing; and shrinkage and slippage, are set up in a recommended commercial standard recently circulated by the National Bureau of Standards for comment.

The draft, developed cooperatively by a committee of three representative commercial laboratories, was considered and approved with modifications by a general conference on June 22, 1935.

Methods recommended for these tests are essentially those standardized by the American Society for Testing Materials (some of which have been approved by the ASA), by the American Association of Textile Chemists and Colorists, and by the Federal Specifications Board.

A second general conference held on September 27, 1935, considered, adjusted, and approved proposed modifications to the recommended commercial standard as approved at the conference of June 22, 1935, and additions thereto on Methods of reporting test results.

Copies of the recommended commercial standard in mimeographed form, as approved on June 22, 1935, may be obtained from the ASA office or from the National Bureau of Standards, Washington, D. C. The action taken at the conference of September 27, 1935, will be available in mimeograph form in the near future.

Martin H. Christopherson

Martin H. Christopherson, director of service of the State Insurance Fund since 1923 and widely known safety engineer, died September 9. He was in his seventieth year.

Mr. Christopherson was a member of the Safety Code Correlating Committee of the American Standards Association, representing the International Association of Industrial Accident Boards and Commissions and the American Society of Mechanical Engineers. He was a member of four sectional committees of the ASA.

Starting as an apprentice with the Crane Elevator Company in Chicago, he became one of the foremost elevator engineers and designers. He was a member of the Sectional Committee on Safety Code for Elevators, Dumbwaiters, and Escalators working under the procedure of the American Standards Association.

During the World War Mr. Christopherson supervised the manufacture of 240-mm French howitzer recuperators for the government. Afterward he prepared an analysis on recuperator manufacture for the War Department.

His experience included positions as general works manager in charge of the Otis plant both here and abroad, chief engineer of the Federal Bakeries Company, Inc., at Davenport, Iowa, and president of the Davenport Manufacturing Company, which built Diesel farm engines.

He was appointed to the New York State Industrial Council in 1917. As a member of this Council he assisted the former Industrial Commission in preparing the Industrial Code of New York State.

He was a leader in endeavors to promote safety in industry.

British Manufacturers Set Gas-Burning Requirements

A standard design for automatic oil-burning equipment and requirements for manufacture and installation of this equipment for central heating and hot-water supply has been approved by the British Oil Burner Manufacturers' Association.

The code specifies provisions for safety devices and automatic controls, pressure gages, wiring requirements, storage tanks, filling and vent connections, alarm devices, dampers and relief doors, refractory linings, ventilation requirements, and fire extinguishing devices.

The association was formed less than two years ago by manufacturers of oil burners and auxiliary equipment.

Industrial Standardization Proves Profitable to Manufacturer and Ultimately to Consumer

Standard parts eliminate duplication, lower production costs, and speed output in manufacturing

Close interrelation between Engineering, Production, Rate, and Cost Departments establishes an economic and efficient system

by

S. P. Kaidanovsky[1]

Electrical and Industrial Engineer

THE manufacturing industry today is confronted with a double problem: The manufacture of *standard* apparatus for mass production, and the manufacture of *special* apparatus to satisfy the particular requirements of a customer.

The question of short-time deliveries is playing such an important role that the manufacturer ought to be prepared, in accepting the order, to make the engineering design and the drawings, and furnish the shop with the necessary manufacturing information,—all in a very short time.

The shop must order the material; the rate department must establish the rate for each operation involved during the manufacture of the apparatus; the time and payroll department must determine the amount of money to be paid to the workman; and the cost department must calculate the cost of the finished product.

In order to accomplish this in a short time, all the operations in each department should be performed in a methodic and efficient way, that overlapping and lost motion may be avoided.

When manufacturing special apparatus, provisions should be made for using the maximum number of standard parts available and for making special parts only when necessary.

[1]For 12 years Engineer at the Sharon Plant of the Westinghouse Electric and Manufacturing Company. Chief Standards Unit, Research and Planning Division of the old NRA. Engaged in Special Research Work in the Division of Review of the new NRA.

In following this plan, all the advantages of mass production can be applied to the manufacture of special apparatus and the latter can be built as quickly as the standard apparatus.

Master Design Specification System—Engineering Department

The Master Design Specification System was developed by the author and applied first in 1925 at the Sharon Plant of the Westinghouse Electric and Manufacturing Company to distribution transformers, and has made possible standardization of parts of the different types.

When the new type Westinghouse Surge Proof Distribution Transformer was developed in 1931, the Master Design Specification System was successfully applied to these transformers, and has greatly facilitated their mass production. Time was an important factor in this case, when a new product was being placed on the market.

In working out the system of master design specifications, the following principle was taken as a basis: Electrical apparatus built for quantity production is composed of some *constant parts* independent on the ultimate application and of some *variable parts* depending on the voltage, current, kv-a, etc. The first step in this work was to separate the constant parts from the variable parts, and second, to subdivide the constant parts into their components, and the variable parts into their components, respectively.

Three master design specifications were assigned for this purpose:

1. Design Specification for mechanical parts.
2. Design Specification for low voltage assemblies
3. Design Specification for high voltage assemblies

Each of these three design specifications was

Standardization Oils Wheels of Industry

Standardization is not a dry-as-dust piece of old bones, dragged out to amuse theorists who delight in working to ten places of decimals; it is a serious attempt to make the wheels of industry and of commerce run more smoothly.

It is a serious attempt at that co-operation which alone will put our industry on to a competitive basis.—*Dr. E. F. Armstrong, F.R.S., Past-Chairman British Standards Institution.*

subdivided into combinations of standard parts. Each individual combination of standard parts was given a number and is detailed on a special form, called "Drawing List." The information specified on the drawing list is prepared in such a manner that, when transmitted to the manufacturing information division of the engineering department, the information writer is able to interpret the drawing list and translate it in such a way that the material specified can be ordered by the Storekeeper, and the production department can establish its schedule. The material specified on the master design specifications is composed of steel, iron, brass, copper, etc. The information for winding of coils is specified on a separate document, called the "Electrical Specification."

Example

Let us take a concrete example: Suppose that we have on schedule a 25kv-a, 2400 to 120/240 volts single phase, 60 cycles, S No. 777206, Westinghouse Surge Proof Distribution Transformer. The engineering information will call for:

Design Specification 271100, Combinations of Standard Parts: 10, 56, 157
Design Specification 271200, Combinations of Standard Parts: 203, 240, 275
Design Specification 271300, Combinations of Standard Parts: 300, 340, 375
Electrical Specifications No. 301006.

Suppose that it is required to build a transformer with taps on the high voltage, namely 2400-2280-2160. All the combinations of standard parts of the master design specifications, specified previously, will be the same, except that combination 301 of Design Specification No. 271300 will be used instead of combination 300. Suppose a low voltage of 240/480 is desired instead of 120/240. In this case combination 202 of Design Specification No. 271200 will be used instead of combination 203.

It will be easily understood that when using the Master Design Specification System all the parts are so standardized that they can be manufactured in great quanities, can be tool made, when it is economical to do so, and most of the material can be kept in stock. This is not only profitable to the manufacturer, but ultimately also to the consumer. The number of standard parts used, being minimum, it is easy to make any improvement in design, when so desired, due to the fact that one change will affect a great number of styles. It helps also the worker on the bench, who can increase his efficiency, working with the same material, following the same assembly instructions, reading the same drawings, etc. It permits the design engineer to determine easily what standard parts he is going to use when handling a special order.

The system of master design specifications is now successfully applied not only to standard apparatus, but to special apparatus as well.

Use in Rate Department

The rate department is supplied with a blueprint copy of the master design specification. After time studies have been made for each individual operation the results are recorded on a special form. By adding the individual standard time values of all operations required for one combination of standard parts, the total standard time of each combination is determined.

The total standard time allowed per unit is obtained by adding the totals for each combination specified for a particular piece of apparatus.

Time and Payroll Department

The time and payroll department is using the information prepared by the rate department, described above.

Cost Department

The cost department is provided with a blueprint copy of the master design specification. The labor and indirect factory expense, plus cost of the material, are calculated for each combination of standard parts of the design specification. The results are recorded on a special form. The cost of each combination of the design specification is calculated and is used until the revision of cost becomes necessary.

In order to obtain the cost of labor, and indirect factory expense plus the material for the

unit, it is only necessary to add the costs of each combination of the three Master Design Specifications called for by the engineer when the order is entered in the shop.

Advantages of Design Specification System

The introduction of the master design specification has greatly facilitated the work of the engineering, rate, and cost departments.

The advantages resulting in the different departments where this system is adopted, are summarized as follows:

Engineering Department — Standardization of parts. Number of design specifications, for each line of apparatus, reduced from several hundred to only three design specifications.

Rate Department—Set-up of standard time values made up once for all, except for adjustments. The number of rate cards at the time of revision in September, 1931, reduced from 11,000 to 600.

Cost Department—Standard cost calculated once for all, except for revision. The number of design specifications and rate cards required for this purpose is exceedingly small.

Master Manufacturing Information System

The Master Manufacturing Information System is a means of transmitting the manufacturing information from the engineering department to the factory. A special division of the engineering department called "The Manufacturing Information Division" performs the duty of interpreting the data specified on the master design specification and furnishes the factory with all the information necessary to order the material and route it to the proper feeder or assembly sections of the factory.

The information writer is provided with the master design specifications, giving the combinations of standard parts called for on the shop order and dictates on a dictaphone the manufacturing information, which in turn is then transcribed by a stenographer on a special form. This form gives the drawing item, the description of material, the style number or pattern, the total quantity per unit, the place where the material is kept in stock and the routing of the material; the latter merely indicating the section, or place where the item is manufactured.

Blue prints are then made of the manufacturing information drawings and these are distributed to the proper production and manufacturing sections in the factory. The drawings are bound in a book.

The manufacturing information division keeps a record of every manufacturing information drawing issued, giving the master design specification and the combination of standard parts for which this drawing was issued.

In case a new line of apparatus is developed and no manufacturing information drawings have been prepared, the information writer will issue a drawing for each combination of standard parts.

In case a line of similar apparatus is being manufactured, the information writer checks his record of manufacturing information drawings to find out what manufacturing information drawings have already been issued and distributed in the factory.

Advantages of Master Manufacturing Information

1. The layout of individual items of which the apparatus is composed, made by the style record section of the standards division engineering department, is performed in a very efficient manner; instead of making the layout every time the combination of standard parts is specified on a shop order, the layout of individual items composing the combination is done once for all.

2. The work of the stock layout and routing division of the equipment and methods department is facilitated proportionately, since the material to consider is limited to those combinations of standard parts of the master design specifications of which no stock and routing has ever been made.

3. The manufacturing information is so arranged that the material pertaining to a certain group of standard parts which is a component of a given apparatus is specified on a separate master manufacturing information drawing.

4. The manufacturing information drawings are written up permanently, except when corrections or changes take place. There is considerably less transcribing and typing when the Master Manufacturing Information System is used, consequently there is less chance of errors.

5. The time required to issue master manufacturing information is approximately 40 per cent of the time required to issue information in the regular way. The question of short deliveries being a very important factor, the Master Manufacturing Information System makes possible the transmittal of information for special apparatus to the factory in a very short time.

6. When used on special apparatus, the master manufacturing information shows at first glance to the production department what material is standard and what is special. This enables the production department to concentrate its efforts on the ordering and routing of special material.

7. The operations necessary to issue master manufacturing information can be readily determined, a true study of these operations can be made, and an incentive plan can be worked out, if so desired.

Safety Glass Saves Life of Motorist

Crashing into the tail end of a platform trailer, the entire top of this car was demolished. The driver, E. J. Lavoie, New York, credits his life to the safety glass windshield. He suffered only minor injuries. The truck was protruding into the street without lights. The car was traveling not faster than 20 mph, Mr. Lavoie reported.

Courtesy of *Safety Engineering.*

Jersey Safety Glass Rules Await American Standard

Rules and regulations for the use of safety glass in New Jersey, effective July 1, 1935, will be subject to change when a safety glass code is promulgated by the American Standards Association, according to the official announcement of the Department of Motor Vehicles.

The rules define "safety glass" as interpreted by the Commissioner of Motor Vehicles, and provide that such glass must be used in doors, windows, and windshields of all cars manufactured on or after July 1, 1935, before they can be registered in New Jersey.

"These rules and regulations are tentative and subject to change," the Commissioner's announcement says, "particularly when and if a safety glass code is promulgated by the American Standards Association."

Argentine Engineers Start Standards Work

Organized standardization in the industrial field has made progress in South America through the setting up of a committee on standards by the Industrial Division of the Centro Nacional de Ingenieros, Buenos Aires, Argentina.

A request for comprehensive information concerning the progress of American national standardization work and its relation to similar work abroad was received recently by the American Standards Association.

Twenty-five countries, located in Australia, Europe, Asia, and North America, now have national standardizing bodies, and a committee on standards has been formed in South Africa.

Zinc-Coating Standard Is First in Series

The first of a series of standard specifications for galvanized materials, a standard for zinc-coated (galvanized) sheets plain and corrugated, was published recently by the Standards Association of Australia.

The specification covers classes of sheets, chemical composition and check analysis of base metal, weight of coating, and weight tests, triple spot test, minimum spot and chemical tests, and bend tests on sheets. Dimensions, tolerances, weight, finish and marking, and testing and inspection facilities are also covered. Standard methods of determining the weight of zinc coating are included.

Composition of the base metal and zinc coating are not covered pending publication of the results of research which is now in process in Australia as well as in other countries.

Copies of the new specification can be ordered through the office of the American Standards Association.

"Wide Scope of News, Valuable Information"

"May I say that *Industrial Standardization* is read carefully here in view of the wide scope of the reports which you publish, and which contain such valuable information.

"We forward copies to Melbourne and Brisbane, two main industrial centers of Australia, and keep one copy here in our technical library."—*W. R. Hebblewhite, Standards Association of Australia.*

Foreign Standards For Sale by ASA

Use serial number when ordering any of the foreign standards listed below. Address a postal card or letter, with name of person to receive the pamphlets, to:

American Standards Association,
29 West 39th Street,
New York.

Standards are printed in language of the country under which they are listed.

Japan

665. Aluminum.
666. Methods of chemical analysis of aluminum.
667. Tin.
668. Methods of chemical analysis of tin.
669. Zinc.
670. Methods of chemical analysis of zinc.
671. Leather belts.
672. Reamers.
673. Shapes and dimensions of tiles.
674. Whitworth fine threads.
675. Wood screws.

Australia

676. Air pillows.
677. Bed blankets.
678. Clinical thermometers.
679. Hot-water bags.
680. Hospital maps.
681. Rubber bandages.
682. Rubber chambers.
683. Surgeons' rubber aprons.
684. Table crockery and chinaware.
685. Waterproof sheeting.
686. Methods of sampling and testing ready-mixed linseed oil paints; genuine white lead, genuine zinc oxide (white), white lead and zinc oxide.
687. Recommended method of fixing for cement concrete roofing tiles.
688. Recommended method of fixing for terra cotta roofing tiles.

Great Britain

689. Amyl acetate.
690. Chemical lead (types A & B)
691. Diacetone alcohol.
692. Ethyl acetate.
693. Normal butyl acetate.
694. Engineering symbols and abbreviations.
695. Graphical symbols for telephony, telegraphy, and radio communication.

Germany

696. Equipment for floor transportation, nomenclature.
697. Field road bridges with a distance between supports up to 12 meters, nominal loads for.
698. Field road bridges with a distance between supports up to 12 meters, widths of.
699. Fillister head screws with internal hexagon.
700. Screw-thread tolerances, explanation of system.
701. Seamless steel cold-drawn pipe, commercial quality.
702. Studs (completely or partially threaded) with internal hexagon and cylindrical point.
703. Studs (completely or partly threaded) with internal hexagon and flat point.
704. Studs (completely or partly threaded) with internal hexagon and taper point.
705. Symbols for strength computations, including symbols for formulas, mathematical symbols, symbols for units of measurement and symbols for steel sections, bars and sheets.
706. Symbols for strength, including special symbols for building construction.
707. Tables for residences and hotels, main dimensions.
708. Wrenches for internal hexagons.

Sweden

709. Construction requirements for transmission lines.
710. Dished boiler end plates.
711. Graphical symbols for telephone, telegraph, and radio.
712. Nomenclature for testing of tensile strength of metals.
713. Standards for the design of electrical equipment to withstand overcurrent conditions.

Great Britain

714. Air-break circuit-breakers for voltages not exceeding 660 volts.
715. Air-break knife switches and air-break isolating switches for voltages not exceeding 660 volts.
716. Alternating current line relays (single-element, 2 position) for railway signalling purposes.
717. Alternating current line relays (2-element, 3-position) for railway signalling purposes.
718. Cement concrete cylindrical pipes and tubes (not reinforced).
719. Concrete interlocking roofing tiles.
720. Derrick cranes (power driven).
721. Dimensions of Edison-type screw lamp-caps and lampholders.
722. Drain fittings, salt-glazed ware and salt-glazed glass (vitreous) enamelled fire clay.
723. Electric power switchgear for indoor and outdoor installations up to and including 220,000 volts.
724. Electric signs.
725. Hard-drawn aluminum and steel-cored aluminum conductors for overhead power transmission purposes.
726. High-tensile structural steel for bridges, etc., and general building construction.
727. Land aerodrome and airway lighting.
728. Light flat-bottom railway rails and fishplates, 14 and 20 lb per yard and portable railway track, 24 in. gauge types 1, 2 and 3.
729. Linseed oil putty, types 1 and 2.
730. Machine-cut gears, B. Bevel (with helical, curved and straight teeth).

731. Metal arc welding as applied to steel structures.
732. Nickel anodes (for electroplating).
733. Salt-glazed glass (vitreous) enamelled fireclay pipes.
734. Sand-lime (calcium silicate) bricks.
735. Steel roller chains and chain wheels.
736. Synthetic-resin bonded-paper sheets (grade 1) for electrical purposes.
737. Totally enclosed air-break circuit-breakers for voltages not exceeding 660 volts.
738. Totally enclosed air-break switches for voltages not exceeding 660 volts.
739. Tungsten filament general service electric lamps.
740. Two-pole and earthing-pin plugs and socket-outlets.

Zinc Coating Standards Are Given ASA Approval

Four standards on zinc coating of iron and steel, adopted by the American Society for Testing Materials after a period of trial by industry, and shown to be generally acceptable to producers and users of zinc-coated iron and steel, have now been given approval as American Standards by the American Standards Association. Drafts of the four standards were published several years ago by the A.S.T.M., and revised according to suggestions received from time to time as the result of experience in actual practice. These standards are:

Standard Specifications for Zinc-Coating (Galvanized) Iron or Steel Telephone and Telegraph Line Wire (G8.3-1935; A.S.T.M. A 111-33)

Standard Specifications for Zinc-Coated (Galvanized) Iron or Steel Tie Wires (G8.4-1935; A.S.T.M. A 112-33)

Standard Specifications for Zinc-Coated Iron or Steel Chain-Link Fence Fabric Galvanized After Weaving (G8.5-1935; A.S.T.M. A 117-33)

Standard Specifications for Zinc-Coated (Galvanized) Iron or Steel Wire Strand (Cable) (G8.6-1935; A.S.T.M. A 122-33)

Specifications for Black and Hot-Dipped Zinc Coated (Galvanized) Welded and Similar Steel Pipe for Ordinary Uses, a tentative standard of the American Society for Testing Materials, was approved as American Tentative Standard (G8.7-1935; A.S.T.M. A 120-34 T) by the American Standards Association.

These specifications were first issued by the A.S.T.M. in 1928 to provide specifications for pipe for ordinary purposes, such as low-pressure service in steam, water, and gas lines where no close bending or coiling is required. No chemical tests and no physical tests except hydrostatic tests were specified but some requirements on zinc coating were included. Technical Committee 4 on Pipes, Conduits, and Their Fittings of the sectional committee considered these specifications in 1931 and 1932 and proposed that the requirements for zinc coating be made more comprehensive. This point of view was accepted and sections on this subject were amplified in the revision issued by the Society in 1934. The revised standard was accepted by the technical committee and the sectional committee in 1935. The revised specifications supplement the American Standard for welded and similar steel pipe (B36.1-1934; A.S.T.M. A 53-33), in which the requirements are more extended and cover a better grade of pipe.

Copies of these standards may be obtained from the American Standards Association, or from the American Society for Testing Materials, 260 South Broad Street, Philadelphia, at 25 cents each. Members of the ASA are entitled to a 20 per cent discount when ordering standards through the ASA office.

Federal Specifications Available at ASA Library

New specifications, recently approved by the Director of Procurement for use in making Government purchases, have been received by the American Standards Association Library. Copies may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., or from the ASA office. The specifications just received are:

Aluminum-Potassium-Sulfate (Potash-Alum); for Photographic Purposes O-A-421
Batteries and Cells; Dry W-B-101a
Cases; Brief, Leather KK-C-121
Conduit; Steel, Rigid, Zinc-Coated WW-C-581a
Cups; Paper, Noncollapsible UU-C-806
Enamel; Interior, Gloss, Light-Tints and White TT-E-506 (Revision of TT-P-46)
Envelopes; Leather KK-E-561
Fiber-Board; Insulating LL-F-321a
Force-Cups; Plumbers' ZZ-F-566
Combs; Rubber (Hard) ZZ-C-551
Gages; Pressure for Direct Stem-Mounting GG-G-66
Gages; Pressure and Vacuum, for Air, Ammonia, Oil, Steam, and Water GG-G-76
Gloves; Working, Cotton, with Leather-Palm JJ-G-451
Hydroquinone (Paradihydroxybenzene O-H-886
Luncheon-Meat PP-L-791
Paper; Carbon, Light-Weight (Typewriter), Black UU-P-151a

International Safety Report Available From ASA Office

A report by Dr. F. Ritzmann, formerly Chief of the Safety Service, International Labor Office, Geneva, has been received by the American Standards Association. The pamphlet, *The International Labour Organization and the Prevention of Industrial Accidents*, can be borrowed from the ASA Library.

A.S.T.M. Proposes 28 Standards Covering Wide Subject Range

TWENTY-EIGHT new proposed standards were approved recently by the American Society for Testing Materials Committee on Standards for publication as tentative standards. Revisions in 14 existing tentative specifications, and tentative revisions in several standards were also approved for publication.

The A.S.T.M. now has a total of 790 specifications, test methods, and definitions, an increase of 62 over last year's total. Of these, 505 have been formally adopted as standards, 285 as tentative standards.

Subjects covered by the new standards include steel, iron-chromium-nickel and related alloys, copper and copper alloys, cement, hollow masonry building units, paints, petroleum products, road and paving materials, and textile materials.

New steel specifications were set up for:

Heat-Treated Carbon-Steel and Alloy Steel Track Bolts

Carbon-Steel and Alloy-Steel Castings for Railroads

Carbon-Steel Castings for Miscellaneous Industrial Uses

Electric Resistance-Welded Steel and Open-Hearth Iron Boiler Tubes

Carbon-Steel Heat Exchanger and Condenser Tubes

Forged Steel Pipe Flanges for General Service

Boiler and Firebox Steel for Stationery Service

Forged or Rolled Alloy-Steel Pipe Flanges, Forged Fittings, etc. for Temperatures up to 1100 F

Extensive revisions in existing tentative specifications for high-strength plates and in specifications for cold-rolled strip steel were approved. Tentative revisions of standards for structural steel and lap-welded and seamless boiler tubes will be published for comment and criticism.

An important feature of the program of A.S.T.M. Committee A-10 for several years has been the development of requirements for various types of alloys. Four such specifications were approved in June, and seven additional specifications were approved at the recent Standards Committee meeting and will be published as tentative standards. The seven new standards in this field are:

Soft Corrosion-Resisting Chromium Steels (Sheets, Flats, Strip)

High-Strength Corrosion-Resisting Chromium-Nickel Steels (Sheets and Strip)

Alloy-Steel Castings:

20 Nickel, 9 Chromium

24 Chromium, 12 Nickel

25 Chromium, 20 Nickel

28 Chromium, 9 Nickel

35 Nickel, 15 Chromium

The specifications cover process and manufacture, chemical properties and tests, physical properties and tests, finish, etc.

Revisions to tentative specifications for copper-silicon alloy wire for general purposes were accepted, involving several changes in physical properties. Tensile requirements range from 135,000 lb per sq in. minimum in the case of spring temper (up to $\frac{1}{4}$ in. included only) to 56,000—68,000 lb per sq in. in the case of annealed material. Two tension tests and one bend test or grain size determination, where required, are provided.

Determining Magnesia Content

Two methods of determining magnesia content in Portland cement were accepted to meet the demand for a more rapid A.S.T.M. method of determining this content. These will be incorporated in the Tentative Methods of Chemical Analysis of Portland Cement (C 114-34 T).

A more satisfactory method of capping irregularly shaped compressive specimens is included as a revision to Methods of Sampling and Testing Structural Clay Tile.

Requirements for Southern Yellow Pine wood to be used in weather tests of paints is the latest in a series of specifications for woods used in paint testing.

A new tentative method of test for vapor pressure of motor and aviation gasoline was approved, replacing the use of the A.S.T.M. Tentative Method of Test for Vapor Pressure of Natural Gasoline (Reid Method) (D 323-32 T) for this purpose. It is hoped that this modified proced-

ure will give results which will be more easily reproduced when testing motor and aviation gasoline.

A modification of the requirements for calibration of specific gravity hydrometers to bring them in line with usual commercial practice was accepted as a tentative revision for publication in the Standard Method of Test for Gravity of Petroleum and Petroleum Products by Means of the Hydrometer (D 287-33).

Nine tentative methods of test for soils were accepted for publication as tentative, covering: Surveying and sampling; Preparation for test; Mechanical analysis; and Determination of liquid limit, plastic limit, plasticity index, centrifuge moisture equivalent, shrinkage factors, and field moisture equivalent.

Two new methods of test were approved as tentative on the recommendation of Committee D-13 on Textile Materials. The test on pile floor covering provides a method of test which is not covered in the present general test method of woven fabrics.

The method of test for fineness of wool will give research workers on wool fiber a common method of test which will make their results available for comparative study.

Revisions to bring the Tentative Specifications for Tolerances and Test Methods for Woolen Yarns (D 403-34 T) and for Worsted Yarns (D 404-34 T) into line with the Typp system and to give improved accuracy in the extraction methods were approved.

Criticism of Standard Specifications for Round-Hole Screens for Testing Purposes (E 17-33) has led to the introduction of tolerances on plate thickness and spacings for openings. These are included in tentative revisions just published.

Canada Asks Exclusive Use Of Purple as Wire Marking

Manufacturers in Canada of insulated wires and cables, insulated flexible cords, heater cords, flexible tubing, non-metallic sheathed cables, and similar products have recently decided to adopt a new color scheme for the identification of these materials.

For more than 25 years manufacturers have used identifying markers consisting of colored threads incorporated in the product, usually woven in the outer braid or cable with the copper strands. The scheme followed in the past was not altogether satisfactory as confusion often resulted from the use of threads of the same color by different companies, although in such cases the identifying threads would be found to have the same identifying marker located on the same place in the product.

When the Hydro-Electric Power Commission of Ontario undertook the work of inspecting and testing these materials in Canada, the possibility of confusion became considerably greater, because it was then necessary to avoid duplication of markers which might possibly be adopted by manufacturers in the United States. For a few months, efforts were made to deal with this problem by frequent interchange, between the Hydro-Electric Power Commission and Underwriters' Laboratories, of revisions to the list of markers assigned to manufacturers on both sides of the border.

This arrangement proved cumbersome and consequently, during the last few months, consideration had been given to a scheme of marking in which a purple thread always twisted with one of another color indicates not only the manufacturer of the product but also the fact that the product is of Canadian manufacture. Such a marker may be placed in any part of the product, as, for instance, cabled with the copper strands; under the braid; woven in the braid, either in a clockwise or counter-clockwise direction; under the insulation; in the cotton separator if one is used; or under the lead sheath.

Reserves Purple for Canada

Arrangements have been made with the Underwriters' Laboratories whereby no marker consisting of a purple thread twisted with that of another color will be assigned by them to a manufacturer in the United States for use on similar products. Underwriters' Laboratories promise to further assist Canadian manufacturers by discouraging the use on the part of the manufacturers in the United States of a purple thread in any form, thus reserving the purple thread for the exclusive use on these products by Canadian manufacturers.

Sizes, Finishes of Tacks And Nails Is Reaffirmed

The simplification of finishes, designations, and sizes of various kinds of bill poster, carpet, upholsterer, basket, trunk and similar tacks and nails, and their containers, has been reaffirmed by a standing committee of the industry, the National Bureau of Standards announced.

This Simplified Practice Recommendation, originally effective on January 1, 1926, was revised on June 19, 1298, under the auspices of the Division of Simplified Practice of the Bureau. Copies of this S.P.R. R47-28, may be had from the Superintendent of Documents, Government Printing Office, Washington, D. C., for ten cents each.

British Electrical Accessory Makers to Develop Standards

An association of electrical accessory manufacturers has been formed in London for the purpose of standardizing dimensions in the interest of changeability, according to *Electrical Times*, London.

In commenting upon this step toward eliminating chaos in the industry, the magazine says:

In earlier years efforts to bring the makers of electrical accessories together for mutual advancement came to little, and then nothing.

"A quite unfounded suspicion that some of the members might by machiavellian methods get the better of others was the chief cause of failure.

"As a result everyone concerned has suffered; the manufacturers, the contractors and the public.

"One of the things which is retarding electrical development (in Great Britain) is the practical certainty that if an extension or replacement is needed, or if the consumer buys a new electrical appliance, the old things will not fit with the new."

—•—

Bureau of Standards Proposes Test for Mixed-Fiber Textiles

Fabrics made from mixed fibers, by no means new to the textile industry, have become of increasing importance in the last few years. Designers have recognized that variety, style, and fresh characteristics can be given to fabrics by judicious mixing of fibers, natural as well as artificial.

One feature of this development that has caused concern to manufacturers and also to consumers has been the difficulty of determining compliance with specifications. Methods for qualitative determination of most of the natural and artificial fibers have been available but reliable laboratory procedures for the qualitative analysis of textiles manufactured from mixed fibers have not been at hand.

Recently, the National Bureau of Standards in its continuing investigation of this problem has proposed a method for the analysis of textiles containing two or more of the following fibers: Cellulose-acetate rayon (acetone-soluble type), silk, regenerated-cellulose rayon (including nitrocellulose, viscose, cuprammonium, and Lilienfeld types), cotton (including mercerized cotton), and wool.

The results of this research are given in the August *Journal of Research* of the National Bureau of Standards and are also available in pamphlet form as RP 821 from the Superintendent of Documents, Government Printing Office, Washington, D. C., at five cents per copy.

Ancient "Plumber Joke" Began Through Lack of Standards

Lack of standards and uniformity of replacement parts is the historic reason why plumbers have been maligned by wags these many years.

In earlier days, a journeyman plumber needed three and sometimes four apprentices to move his stock of replacement parts and materials from repair job to repair job, so diverse were the installations.

In Great Britain the electrical industry is just now emerging from a similarly embarrassing cloud, according to E. E. Bland, of London. "When I send a repair man to replace a one-way switch," he said recently, "he takes no less than ten sorts of switches to save a second journey.

"This is an improvement, but thorough standardization cannot come too quickly in the interests of the user householder, the electrical contractor, and manufacturers of devices."

Tests Demonstrate Method for Increasing the Stability of Ink

A general study of iron gallate writing ink was undertaken at the Bureau in an attempt to improve the keeping quality of ink, without increasing the acid content. All inks of this type contain iron, and since the standard ink contains 3 grams of iron per liter, this figure was used as the starting point in devising the ink formulas.

Experimental inks, using different materials in varying concentrations, were prepared and tested according to the procedure given in the Federal Specification for writing ink. It was found that the use of gallic acid without tannic acid produced an ink with greater stability, and consequently the acid content could be decreased. This in turn decreased the corrosion of steel pens. The resulting ink had remarkably good stability.

It was found that this modified formula could be adapted to the preparation of an ink powder without changing the characteristics of the ink. The ink powder, if properly prepared, does not readily take up sufficient moisture to form a cake. These results are reported in full in the *Journal of Research* for July (R-807).—*Technical News Bulletin, National Bureau of Standards, July.*

McBurney Returns to Bureau To Continue Research Work

J. W. McBurney, who joined the staff of the American Standards Association in August, 1934, has returned to the National Bureau of Standards and has been assigned to the Division of Clay and Silicate Products.

Mr. McBurney will resume his researches in this field in which he is a nationally known authority, and will continue acting as secretary of ASA Sectional Committees A41 on Manual of Good Practice for Brick Masonry and A42, Specifications for Plastering.

Prior to joining the ASA, Mr. McBurney had been a research associate at the Bureau for the Ashphalt and Mastic Tile Association, and served on three sectional committees of the ASA.

He graduated from Ohio State University in 1913, and for four years served as bacteriologist with the U. S. Public Health Service. For the next three years he was a chemist with the Youngstown Sheet & Tube Company. In 1921 he was appointed testing engineer for the Cleveland Board of Education, where he was instrumental in setting up technical specifications for building materials and a wide range of school supplies used by the Board. He developed methods for testing many of these supplies. These, and many of the specifications he wrote, are still in use.

After two years as director of the technical service department of the Standard Point & Lead Works, he became research associate for the Common Brick Manufacturers Association at the Bureau of Standards and served in that capacity from 1926 to 1932.

Mr. McBurney has been the author of a number of technical papers on the properties of materials. The nature of his work is indicated by the following titles of papers which have appeared in the Proceedings of the American Society for Testing Materials:

The Effect of Strength of Brick on the Compression Strength of Brick Masonry

The Water Absorption and Penetrability of Brick

The Weathering of Structural Clay Products: A Review

Strength, Water Absorption and Weather Resistance of Building Brick Produced in the United States

Indentation of Asphalt Tile

The Relation of Freezing and Thawing Resistance to Physical Properties of Clay and and Shale Building Brick.

Revise Analysis of Lead To Meet Up-to-Date Practice

To keep analytical methods of laboratory analysis current with research and technical advancement, the American Society for Testing Materials recently proposed approval by the American Standards Association of a revision in Standard Methods of Routine Analysis of Dry Red Lead. The revised standard was approved as American Standard with the designations of ASA K16.1-1935; A.S.T.M. D 49-35.

Copies of the newly revised standard are available from the American Standards Association, or from the American Society for Testing Materials, 260 South Broad Street, Philadelphia, at 25 cents each.

Sales Shift in Sizes of Brick Causes Simplification Revision

Because of an increase in the sale of one type of brick and decrease in the sale of another during the past few years, Simplified Practice Recommendation R1-32, Vitrified Paving Brick, was revised recently, according to an announcement from the Division of Simplified Practice, National Bureau of Standards.

The revision eliminates from the list of recognized varieties of brick the 3 in. x 3½ in. x 8½ in. wire-cut lug brick and the 4 in. x 3½ in. x 8½ in. wire-cut lug brick. Included in the list of recognized varieties in place of these two sizes of brick are 2½ in. x 4 in. x 8½ in. vertical fiber lug brick and 3½ in. x 4 in. x 8½ in. vertical fiber lug brick.

A survey which had been compiled to show the character of brick shipments during 1934 showed that shipments of the two sizes of vertical fiber lug brick included in the revised recommendation increased materially during that period, while shipments of the two sizes of wire-cut lug brick eliminated from the recommendation declined considerably.

Copies of the Simplified Practice Recommendation, as revised, now numbered R1-35, may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., or from the American Standards Association, at five cents each.

Hundreds of New American Standard Projects in Many Fields Under Way

HUNDREDS of American Standards and American Safety Code projects are constantly being developed and revised. For the information of our readers, the following list is published to show on what new projects work is being done, and on which Standards and Safety Codes revisions are being made by their respective committees.

Each of these projects, like all ASA work, is being developed by Sectional Committees upon which are represented spokesmen of consumers, manufacturers, governmental departments and independent experts especially qualified to make valuable contributions in their respective fields.

The following list supplements the pamphlet "A Manual of American Standards," published in the August, 1935, issue of INDUSTRIAL STANDARDIZATION:

A. Civil Engineering and Building Trades

A17-1931 *Elevators, Dumbwaiters and Escalators, Safety Code for* — *Am. Std. under revision*
A17a *Elevator Inspectors' Handbook*
A21 *Cast Iron Pipe and Special Castings, Specifications for*
A21a *Dimensions*
A21b *Metallurgy, Processes and Tests*
A21c *Corrosion and Protective Coatings*
A22 *Walkway Surfaces, Safety Code for*
A35 *Manhole Frames and Covers*
A36 *Rating of Rivers*
A40 *Minimum Requirements for Plumbing and Standardization of Plumbing Equipment*
A40a *Cast Iron Soil Pipe and Fittings*
A40i *Proposed Code for Range Boilers and Hot Water Storage Tanks*
A40.5 *Traps*
Gasoline, Oil and Grease Separators
A41 *Brick Masonry, Recommended Practice for*
A42 *Plastering, Specifications for*
A44 *Organic Impurities in Sands for Concrete, Method of Test for*
A45 *Sieve Analysis of Aggregate for Concrete, Method of Test for*

B. Mechanical Engineering

B1 *Screw Threads, Standardization and Unification of*
B1b *Screw Thread Gages and Gaging of Screw Threads*
B2-1919 *Pipe Thread* — *Under revision*
B2a *Screw Threads for Rigid Electrical Conduits*
B2b *Taper Pipe Threads*
B2c *Straight Pipe Threads*
B2d *Plumbers' Threads*
B3 *Ball and Roller Bearings*
B3c *Taper Roller Bearings*
B3d *Adapter-Sleeve Bearings*
B4 *Cylindrical Parts and Limit Gages, Allowances and Tolerances for*
B4a-1925 *Metal Fits, Tolerances, Allowances and Gages for* — *Under revision (Under revision as B4.1-Tolerance Systems)*
B4b *Plain Limit Gages, Methods of Gaging and Specifications for*
B5 *Small Tools and Machine Tool Elements, Standards for*
B5d *Machine Tapers, Dimensions of*
B5f *Machine Tools, Designations and Working Ranges of*
B5g2 *Chuck and Chuck Jaws*
B5h *Spindle Noses and Collets for Machine Tools*
B5i *Punch Press Tools*
B5j *Circular Forming Tools and Holders*
B5k *Twist Drill Sizes*
B5m *Splined Shafts and Splines, Dimensions of*
B5n *Electric Welding Dies and Electrode Holders*
B5o *Milling Machine Tables*
B5p *Rotating Tool Shanks*
B5q *Small Tools and Machine Tool Elements, Nomenclature for*
B5r *Multiple spindle (drill heads) and drill head spindles and bearings, Standardization of*
B6 *Gears, Standardization of*
B6a *Nomenclature*
B6c *Helical Gears*
B6d *Worm Gears*
B6e *Bevel Gears*
B6g *Inspection*
B6h *Power Rating*
B9-1933 *Mechanical Refrigeration, Safety Code for* — *Am. Std. under revision*
B11-1926 *Power Presses and Foot and Hand Presses, Safety Code for* — *Am. Std. under revision*
B14 *Machine Tools, Safety Code for*
B16 *Pipe Flanges and Fittings*
B16d1 *Pipe Plugs*
B16e2 *Steel Companion Flanges for Maximum WSP of 180, 225, 325, 500, 750, 1000, 1500 and 2500 Lb per Sq In. (Gage) at or near the Ordinary Range of Air Temperatures*
B16e3 *Steel Welding Neck Flanges*
B16h *Ammonia Flanged Fittings and Companion Flanges*
B16i *Face to Face Dimensions of Ferrous Flanged Valves*
B16j *Malleable Iron or Steel Unions (Brass Seat) for a Minimum Steam Pressure of 300 Lb*
B18 *Bolt, Nut and Rivet Proportions*
B18b1 *Stud and Stud Bolt Dimensions*
B18h *Large Rivets*
B18i *Socket Set Screws and Socket Head Cap Screws*
B19 *Compressed Air Machinery and Equipment, Safety Code for*

B20 *Conveyors and Conveying Machinery, Safety Code for*
B25 *Plate and Sheet Metal Working, Safety Code for*
B27 *Plain and Lock Washers*
B27a *Plain Washers*
B27b *Lock Washers*
B29 *Transmission Chains and Sprockets*
B29b *Silent Chains*
B30 *Cranes, Derricks and Hoists, Safety Code for*
B31 *Pressure Piping, Code for*
B31b *Hydraulic Piping*
B31d *Refrigerating Piping*
B31f *Piping Materials and Identifications*
B31g *Fabrication Details*
B32 *Wire and Sheet Metal Gages*
B36 *Dimensions and Materials of Wrought Iron and Wrought Steel Pipe and Tubing, Standardization of*
B36.3-1934 *Lap-Welded and Seamless Steel Pipe for High-Temperature Service, Specifications for* *Amer. Tent. Std. under revision*
B36.6-1934 *Forge-Welded Steel Pipe, Specifications for* *Amer. Tent. Std. under revision*
B36.9-1934 *Electric-Fusion-Welded Steel Pipe (Sizes 8 in. to but not including 30 in.), Specifications for* *Am. Tent. Std. under revision*
B36.10 *Wrought Iron and Wrought Steel Pipe*
B38 *Refrigerators, Standards and Specifications for*
B38a *Users' Requirements as to Temperature, Humidity, Layout and Arrangement, Selection of Data for Nameplate*
B38b *Refrigerators—Design Details, Dimensions, General Requirements for Material and Construction*
B40 *Pressure and Vacuum Gages, Specifications for*
B41 *Stock Sizes, Shapes and Lengths for Iron and Steel Bars, Including Flats, Squares, Rounds and other Shapes*
B42 *Leather Belting, Specifications for*
B43 *Machine Pins, Dimensions of*
B44 *Industrial Thermometers, Specifications for*
B46 *Surface Qualities, Classification and Designation of*
B50 *Unification of Rules for the Dimensioning of Furnaces for Burning Solid Fuel*
B51 *Testing and Rating Air Cleaning Devices Used in General Ventilation Work, Code for*

C. Electrical Engineering

C6-1925 *Terminal Markings for Electrical Apparatus* *Am. Std. under revision*
(Under revision as Standard Connections and Terminal Markings for Electric Power Apparatus)
C8 *Wires and Cables, Insulated (Other than Telephone and Telegraph), Specifications for*
C8d1-1928 *30% Rubber Insulation for Wire and Cable for General Purposes, Specifications for* *Amer. Tent. Std. under revision*
(Under revision as Class A 30 Per Cent Rubber Insulation for Wire and Cable for General Purposes, Specifications for)
C8j1-1928 *Cotton Covered Round Copper Magnet Wire, Specifications for* *Am. Tent. Std. under revision*
C8j2-1928 *Silk Covered Round Copper Magnet Wire, Specifications for* *Am. Tent. Std. under revision*
C8j3-1928 *Enameled Round Copper Magnet Wire, Specifications for* *Am. Tent. Std. under revision*
C8k1-1932 *Weatherproof (Weather Resisting) Wires and Cables, Specifications for* *Am. Tent. Std. under revision*
C8.11-1933 *Code Rubber Insulation for Wire and Cable for General Purposes, Specifications for* *Am. Std. under revision*
—— *Conductors and Stranding, Specifications for*
—— *Varnished Cloth Insulation, Specifications for*
—— *Metallic Coverings, Specifications for*
—— *Class AO 30 Per Cent Rubber Insulation for Wire and Cable for General Purposes, Specifications for*
—— *Tree Wire Coverings, Specifications for*
C10-1924 *Electrical Equipment of Buildings, Standard Symbols for* *Am. Tent. Std. under revision*
C16 *Radio*
C16a *Terms Used in Radio, Standard Definitions of*
C16b *Broadcast Radio Receivers, Standard Tests of*
C17 *Miscellaneous Pole Line Materials, Specifications for*
C18-1930 *Dry Cells and Batteries, Specifications for* *Under revision*
C28 *Electric Motor Frame Dimensions*
C34 *Mercury Arc Rectifiers*
C35-1928 *Railway Motors* *Under revision*
(Under revision as Rotating Electrical Equipment for Railway Cars and Locomotives)
C37 *Power Switchgear*
C39 *Electrical Measuring Instruments*
C42 *Electrical Terms, Definitions of*
C43 *Overhead Trolley Line Material, Standards for*
C50 *Rotating Electrical Machinery*
C50.1 *Definitions*
C50.2 *Direct-Current Rotating Machines*
C50.3 *Synchronous Generators, Synchronous Motors and Synchronous Machines in General*
C50.4 *Synchronous Converters*
C50.5 *Induction Motors and Induction Machines in General*
C50.6 *Direct-Current and Alternating-Current Fractional-Horsepower Motors*
C50c1-1928 *Induction Motors and Induction Machines in General, Rating Provisions of* *Am. Std. under revision*
(Under revision as part of C50.5)
C57 *Transformers*
C57.2 *Transformers, Induction Regulators and Reactors*
—— *Instrument Transformers*
C58 *Shellac, Synthetic Resins and other Similar Insulating Materials*
C59 *Electrical Insulating Materials in General*
C59.2-1935 *Electrical Insulating Oils, Methods of Testing* *Am. Std. under revision*
—— *Electrical Porcelain, Methods of Testing*
C60 *Vacuum Tubes for Industrial Purposes, Standardization of*
C61 *Electric and Magnetic Magnitudes and Units*
C62 *Lightning Arresters*

D. Automotive (Automobile and Aircraft)

D1-1925 *Aeronautic Safety Code* *Am. Tent. Std. under revision*
D2-1925 *Automobile Headlighting, Safety Code for—Laboratory Tests for Approval of Electric Headlighting Devices for Motor Vehicles* *Under revision*
(Under revision as Laboratory Tests, Automobile Electric Headlamps)
D4-1927 *Brakes and Brake Testing, Safety Code for* *Under revision*

G. Ferrous Metallurgy

G8 *Zinc Coating of Iron and Steel, Specifications for*
G8a *Zinc Coating (Hot-Dip) of Hardware and Fastenings*
G8d *Zinc Coating of Pipes, Conduits and their Fittings*
G8e *Zinc Coating of Wire and Wire Products*
G8f *Zinc Coating of Marine Hardware and Ship Fittings*
G8g *Methods of Testing*
—— *Zinc-Coating (Galvanized) Iron or Steel Tele-*

phone and Telegraph Line Wire, Specifications for
— *Zinc-Coated (Galvanized) Iron and Steel Tie Wires, Specifications for*
— *Zinc-Coated Iron or Steel Chain-Link Fence Fabric Galvanized After Weaving, Specifications for*
— *Zinc-Coated (Galvanized) Iron or Steel Wire Strand (Cable), Specifications for*
— *Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless Steel Pipe for Ordinary Uses, Specifications for*

H. Non-Ferrous Metallurgy

H1 *Zinc and Zinc Ores*
H15 *Medium Hand-Drawn Copper Wire, Specifications for*
H19 *Sheet High Brass, Specifications for*
H20 *Manganese-Bronze Sand Castings, Specifications for*
H21 *Maganese-Bronze Ingots for Sand Castings, Specifications for*
H22 *Trolley Wire, Specifications for*
H22.1 *Bronze Trolley Wire, Specifications for*
H22.2 *Copper Trolley Wire, Specifications for*

K. Chemical Industry

K3-1921 *Manganese Bronze, Methods of Chemical Analysis of* *Am. Tent. Std. under revision*
K16-1930 *Dry Red Lead, Methods of Routine Analysis of* *Am. Std. under revision*
K19 *Fuel Oils, Specifications for*

L. Textile Industry

L3-1931 *Cotton Rubber-Lined Fire Hose, for Public and Private Fire Department Use, Specifications for* *Am. Tent. Std. under revision*
L4 *Sheets and Sheeting, Specifications and Standards for*
L6 *Blankets, Specifications for*
L8 *Hosiery Lengths*
L9 *Shrinkage of Woven Cotton Yard Goods, Specifications for*

M. Mining

M20 *Classifications of Coals*
M20.1 *Classification of Coal by Rank*
M20.2 *Classification of Coal by Grade*
M21 *Coal Mine Cars, Specifications for*
M22 *Mine Timbering, Specifications for*
M25 *Trolley, Storage Battery and Combination Type Locomotives for Coal Mines, Specifications for*
M26 *Clean Bituminous Coal, Specifications for*

P. Pulp and Paper Industry

P1-1925 *Paper and Pulp Mills, Safety Code for* *Under Revision*

X, Z. Miscellaneous

X2-1922 *Protection of the Heads and Eyes of Industrial Workers, Safety Code for the* *Am. Std. under revision*
(Under revision as Safety Code for the Protection of Heads, Eyes and Respiratory Organs of Industrial Workers)
Z5 *Ventilation Code*
Z9 *Exhaust Systems, Safety Code for*
Z11 *Petroleum Products and Lubricants, Methods of Testing*
Z11.8-1930 *Water and Sediment in Petroleum Products, by Means of Centrifuge, Method of Test for* *Am. Std. under revision*
Z11.10-1930 *Distillation of Gasoline, Naphtha, Kerosene and Similar Petroleum Products, Method of Test for* *Am. Std. under revision*
Z11.28-1932 *Definitions of Terms Relating to Petroleum* *Am. Tent. Std. under revision*
Z11.29-1932 *Dilution of Crankcase Oils, Method of Test for* *Am. Tent. Std. under revision*
Z11.30-1932 *Precipitation Number of Lubricating Oils, Method of Test for* *Am. Tent. Std. under revision*
— *Distillation of Crude Petroleum*
— *Sampling Petroleum and Petroleum Products*
— *Color of Lubricating Oils by Means of ASTM Union Colorimeter*
— *Color of Refined Petroleum Oil by Means of Saybolt Chromometer*
— *Gum Content of Gasoline*
— *Knock Characteristics of Motor Fuels*
— *Sulfur in Petroleum Oils by Lamp Method*
— *Viscosity-Temperature Chart for Liquid Petroleum Products*
Z13 *Amusement Parks, Safety Code for*
Z14 *Drawings and Drafting Room Practice (Exclusive of Architectural Drawings), Standards for*
Z14a *Paper and Cloth, Specifications for*
Z14f *Drawings, Graphical Symbols on*
Z15 *Graphic Presentation, Standards for*
Z15a *Terminology in Graphic Presentation*
Z15b *Time Series Charts*
Z15c *Non-Time Series Charts*
Z15d *Survey of Current Practice*
Z15e *Engineering and Scientific Graphs*
Z16 *Methods of Recording and Compiling Accident Statistics, Standardization of*
Z17 *Preferred Numbers, Table of (Informally Approved (1927) and Recommended to Industry for a Period of Trial in Practice)* *Under revision*
Z18 *Speeds of Machinery, Standardization of*
Z20 *Grandstands, Safety Code for*
Z20.1 *Portable Steel and Wood Grandstands*
Z21 *Approval and Installation Requirements for Gas Burning Appliances*
Z21.1-1933 *Gas Ranges, Approval Requirements for* *Am. Std. under revision*
Z21.11-1933 *Gas Space Heaters, Approval Requirements for* *Am. Std. under revision*
Z21.12-1933 *Draft Hoods, Listing Requirements for* *Am. Std. under revision*
Z21.13-1934 *Central Heating Gas Appliances, Approval Requirements for* *Am. Std. under revision*
Z21.19 *Gas Refrigerators, Approval Requirements for*
Z21d *Gas, Pressure, and Temperature, Control Accessories, Listing Requirements for*
Z21p *House Piping and Appliances, Installation Requirements for*
Z23 *Sieves for Testing Purposes, Specifications for*
Z24 *Acoustical Measurements and Terminology*
Z24.1 *Acoustical Terminology*
Z24.2 *Noise Measurement*
— *Sound Level Meters*
Z25 *Rounding Numerical Values, Rules for*
Z26 *Safety Glass, Specifications and Methods of Testing for*
Z28 *Work in Compressed Air*
Z29.1 *Reference Data for Periodicals*
Z32 *Graphical Symbols*

Safety PAYS!

Does Your FACTORY meet the MINIMUM requirements for Industrial Safety ?

The following American Standard Industrial Safety Codes are being used by many State Regulatory Authorities and by Insurance Safety Engineers and Inspectors:

A2-1934	Specifications for Fire Tests of Building Construction and Materials (ASTM C19-33)	$ .25
A9-1935	Building Exits Code	.75
A10-1934	Safety in the Construction Industry ("Manual of Accident Prevention in Construction", by Associated General Contractors of America)	2.00
A11-1930	Lighting Factories, Mills and Other Work Places, Code of (Lab. Stat. Bull. 556)	.20
A12-1932	Floor and Wall Openings, Railings and Toe Boards, Safety Code for	.20
A14-1935	Safety Code for the Construction, Care and Use of Ladders	.25
A17-1931	Elevators, Dumbwaiters and Escalators, Safety Code for	1.00
A39-1933	Window Cleaning, Safety Code for	.20
B7-1935	Abrasive Wheels, Safety Code for the Use, Care and Protection of	.10
B8-1932	Protection of Industrial Workers in Foundries, Safety Code for	.20
B9-1933	Mechanical Refrigeration, Safety Code for	.30
B11-1926	Power Presses and Foot and Hand Presses, Safety Code for (Lab. Stat. Bull. 430)	.20
B13-1924	Logging and Sawmill Safety Code. (Bur. Stds. Handbook 5)	.60
B15-1927	Mechanical Power Transmission Apparatus, Safety Code for	.35
B24-1927	Forging and Hot Metal Stamping, Safety Code for (Lab. Stat. Bull. 451)	.15
B28a-1927	Rubber Mills and Calendars, Safety Code for (Lab. Stat. Bull. 447)	.05
B31.1-1935	Code for Pressure Piping	1.00
C1-1935	Electric Wiring and Apparatus in Relation to Fire Hazard (National Electrical Code)	.05
C2-1927	National Electrical Safety Code	1.20
C5.1-1933	Code for Protection Against Lightning Part I, Protection of Persons	
C5.2-1933	Part II, Protection of Buildings and Miscellaneous Property	
C5.3-1929	Part III, Protection of Structures Containing Inflammable Liquids and Gases Published in one pamphlet (Bur. Stds. Handbook 17)	.15
K2-1927	Gas Safety Code	.20
K13-1930	Gas-Mask Canisters, Code for Identification (Lab. Stat. Bull. 512)	.05
L1-1929	Textile Safety Code (Lab. Stat. Bull. 509)	.05
O1-1930	Woodworking Plants, Safety Code for (Lab. Stat. Bull. 519)	.10
P1-1925	Paper and Pulp Mills, Safety Code for (Lab. Stat. Bull. 410)	.15
Z4.1-1935	Safety Code for Industrial Sanitation in Manufacturing Establishments	.20
Z4.2-1935	Specifications for Drinking Fountains	.10
Z4.3-1935	Specifications for the Sanitary Privy (Supplement Number 108 to the Public Health Reports)	.10
Z8-1924	Laundry Machinery and Operations, Safety Code for (Lab. Stat. Bull. 375)	.05
Z33-1935	Fire Protection Code for Blower and Exhaust Systems	.10

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